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CONTENTS.

An Asterisk (*) denotes an illustrated article.

OFFICIAL NOTICE—
The August Outing of the Society of Gas Lighting..... 241
EDITORIALS—
Briefly Told..... 241
The Richmond (Va.) Common Council Cuts the Salary of the Superintendent of Its Gas Works—Death of Mr. W. C. Humphrys.
The Determination of Water in Commercial Samples of Sulphate of Ammonia..... 242
Third Annual Meeting of the Pacific Coast Gas Association—Official Report—Concluded from page 210..... 242
First Day, Afternoon Session—*Wrinkle Department, Edited by Mr. T. R. Parker—One Year's Experience With Welsbach Burners, by Mr. E. C. Randall—Discussion—An Interlude—Second Day—Treatment of Our Customers, by Mr. C. M. Gregory—Discussion—Producer Gas, by Mr. H. E. Adams—Discussion—Notes on Calcic Carbide, by Mr. E. C. Jones—Discussion—Report of Obituary Committee—Report of Committee on Nominations—Election of Officers—Responses—Report of Committee on Next Place of Meeting—Report of Committee on President's Address—The Question Box—Two Communications—Votes of Thanks—Adjourned.
ITEMS OF INTEREST FROM VARIOUS LOCALITIES..... 256
Death of Mr. John M. Hansen—Improving the Danville (Ky.) Works—Death of Mr. Simon Schiele—Increasing the Stock, Wilmington, Del.—Death of Mr. L. B. Clough—Memorial Action by Monmouth County Bar on the Late Mr. C. A. Bennett, Jr.—The Sums Paid into the City Treasury by the Cleveland (O.) Companies—Cheaper Gas for Beverly, Mass.—Annual Meeting, Southbridge, Mass.—Gas Works for Bennington, Vt.—Annual Meeting, Lowell, Mass.—Annual Meeting, Fall River, Mass.—Ditto, Woburn, Mass.—Changes in the New Memphis (Tenn.) Company—Public Lighting, South Orange, N.J.—Gas Rates, Bay City, Mich.—Chief Park on the Complaints of Gas Consumers—And Other Items.
The Market for Gas Securities..... 257

[OFFICIAL NOTICE.]

The August Outing of the Society of Gas Lighting.

OFFICE OF THE SECRETARY, BROOKLYN, N. Y., Aug. 7, 1895.

A regular meeting of the Society of Gas Lighting will be held at Squantum, R. I., on Wednesday, August 14th. Take boat leaving for Providence, from new pier, No. 36, North river, one block above Canal street, at 5.30 P.M., Tuesday, August 13th.

FRED. S. BENSON, Secretary.

BRIEFLY TOLD.

THE RICHMOND (VA.) COMMON COUNCIL CUTS THE SALARY OF THE SUPERINTENDENT OF ITS GAS WORKS.—Presuming that everyone connected with the gas business of the country is aware of the fact that the supplying of gas to the city of Richmond, Va., is carried on under the direction of the municipal authorities, we need not here say much about the laws which govern the administration of its affairs. However, we might accurately characterize the chapter and verse of its ordinances or regulations as being of the most incoherent and irregular description. Nor is this to be wondered over, when one remembers that the regulations are tinkered with by every successive Council, and the newer the new Councilman is in civic experience, why, the more he knows at the start respecting the trusts handed over to his callow care. In fact, the wonder would be that incoherence and irregularity were not the rule under the circumstances. With that understanding of the case we may come to the point, without further preface, and so we present the following comment on the action recently taken (to be precise, on the evening of last Monday) by the Common Council of Richmond respecting the salary, to be paid "until further notice" to the Superintendent of the municipal gas works. In stating the case it will be necessary (and the reference to this unfortunate part of the matter will be as brief as possible) to refer to the chaotic condition in which the accounts of the late Mr. W. C. Adams, for years the Superintendent and Purchasing Agent of the works, were found, following an investigation subsequent to his demise. The committee that investigated the works' books reported a discrepancy considerably in excess of $20,000, and while it is not directly charged that Mr. Adams was solely responsible for this, it nevertheless stands that the Council directed the bringing of a suit against his estate for the sum named; nor was anyone else ordered impleaded with the estate. While in life, Mr. Adams' name and fame were guarantees of his honor and probity, and we shall not believe that a smirch rests upon his memory until the law shall say that he was other than an honest man. During his tenure of office, by niggardly and grudgingly given advances, his compensation as managing head of the Richmond works reached the maximum of $3,600 per annum. And we submit that such a payment, for the services rendered, was entirely inadequate compensation, since the output of the works, in the past year, for instance, was roundly up to 225,000,000 cubic feet. In private hands—rather, under company ownership—this charge per 1,000 cubic feet for superintendence would be considered decidedly on the cheap side, especially keeping in view the state of affairs existing in Richmond, where the life of the managing man is one of constant anxiety because of the imperfect condition of the plant he supervises—its imperfections arising from the unwillingness of the municipality to keep even the existing plant in repair. Blind to the outcome of the past, however, the Richmond authorities are evidently disposed to go from bad to worse, for on the date above named the Council adopted a resolution putting the Superintendent's salary at $2,500. To us this seems to be marking up a premium on dishonesty, for it is an utter impossibility for a man holding the position named to support himself in the style that the necessities of the place demand on the stipend named, unless the occupant is the fortunate possessor of other income on private account which he is willing to devote to public account.

DEATH OF MR. W. C. HUMPHRYS.—We regret to report the death of Mr. W. C. Humphrys, the father of our English correspondent, Mr. Norton H. Humphrys, of Salisbury. Deceased had attained the glorious age of 86 years, and in his active business life—he retired from active duty some years ago—he had much to do with the gas and water interests of England. Notable in this respect was his connection with the Barnet District Gas and Water Company. He was a member of the British Association of Gas Managers.

The Determination of Water in Commercial Samples of Sulphate of Ammonia.

Mr. John Hughes, F.I.C., writing to the *Chemical News* on this subject, says:

It is not generally usual to state the percentage of water present in commercial samples of sulphate of ammonia. Occasionally chemists are asked to do so, and also to specify the amount of acidity; and in such case the figures are given. But usually only the percentage of nitrogen equal to ammonia is reported. The writer thinks it would be desirable and useful that the percentage of water lost at 212° F., and the acidity expressed as sulphuric acid (H_2SO_4), should always accompany the figures for nitrogen and ammonia on the certificate.

Sulphate of ammonia, when ground up in a mortar, rapidly loses moisture in a hot, dry atmosphere. Consequently, in order to make a correct report on the percentage of nitrogen contained in the sulphate of ammonia in its natural state as received, it becomes necessary to make two water determinations—one in the sample as turned out in its rough, damp state before grinding, and one in the finely-ground portion prepared for the purposes of analysis; the analytical results being afterwards calculated into the natural state as received, and reported accordingly.

The question of water really is a most important one, bearing in mind the commercial value of the material and the fact that every 1 per cent. of water lost represents an increase of 0.25 per cent. of ammonia. It is true that the introduction of centrifugal machines has largely reduced the proportions of water and acidity in the sulphate of ammonia as sent out; but there is still sufficient difference between the dampness respectively at the top and the bottom of the bags to make the sampling a matter of great importance.

The following twelve samples, representing one delivery of yellow sulphate of ammonia, were furnished to the writer by a large London manure firm, six bags being selected, and samples drawn respectively from the top and bottom of each. The proportions of water and acidity were then carefully determined as above suggested, a weak solution of litmus being employed as the indicator in titration for acidity:

Top Samples.

	Water as Received.	Water as Analyzed.	Water Lost During Preparation.	Free Acid Calculated as H_2SO_4.
1	1.98	1.26	0.72	0.97
2	1 81	1.42	0.39	0.63
3	1.59	1.20	0.39	0.65
4	0.87	0.48	0.39	0.81
5	1.12	0.50	0.62	0.79
6	1.32	0.72	0.60	1.03
Average	1.45	0.93	0.52	0.81

Bottom Samples.

	Water as Received.	Water as Analyzed.	Water Lost During Preparation.	Free Acid Calculated as H_2SO_4.
1	2.62	1.64	0.98	1.24
2	2.65	1.94	0.71	0.81
3	2.53	1.76	0.77	0.80
4	3.14	2.12	1.02	1.22
5	1.97	1.24	0.73	0.71
6	2.39	1.84	0.55	1.07
Average	2.55	1.76	0.79	0.97

It will be noticed that the differences are considerable, the top samples being much drier than the bottom ones. In No. 4, the difference was as much as 2.27 per cent.—representing 0.56 per cent. of ammonia; and the water lost during preparation amounted in some cases to upwards of 1 per cent., or equal to 0.25 per cent. of ammonia. Of course, this loss during preparation will vary with the degree of grinding, the time exposed, and the temperature and humidity of the atmosphere.

The following figures in seven other samples, eaah representing a separate delivery, and analyzed at a different time, will serve to indicate the variation that may be expected:

Color.	Water as Received.	Water as Analyzed.	Water Lost During Preparation.	Free Acid Calculated as H_2SO_4.
White	2.20	1.80	0.40	0.29
Yellow	1.94	1.50	0.44	0.31
"	2.31	2.06	0.25	0.15
Gray	2.96	2.74	0.22	0.38
White	1.70	1.10	0.60	0.15
"	1.90	1.40	0.50	0.23
"	1.89	1.32	0.57	0.25
Average	2.13	1.70	0.42	0.25

The amount of acidity is of importance, because, if not excessive—say, not more than 0.5 per cent.—the sulphate of ammonia can be safely shipped in double bags, instead of in the more expensive casks which were formerly used. If the certificate of the analyst contains information as to the percentage of water and acidity, in addition to the figures for nitrogen equal to ammonia, the identity of the sample with the bulk can be more readily established than when the figures for ammonia only are stated.

[Official Report—Continued from page 210.]

THIRD ANNUAL MEETING OF THE PACIFIC COAST GAS ASSOCIATION.

Held in San Francisco, Cal., July 16 and 17, 1895.

First Day—Afternoon Session.

The President then called upon Mr. T. R. Parker to set forth the

WRINKLES

which he had collected and edited, with the following result:

Mr. President and Gentlemen: In looking up the etymology of the word "Wrinkles," I find the sense we use it in implies a curious or ingenious notion or device. Also a useful bit of information, a bright idea or method, a little turn or twist of fancy.

Viewing it in this light, I accepted the position tendered me by our then retiring President, Mr. J. B. Crockett, with the hope that the gleanings from the territory embraced by our Association would be a fruitful source of entertainment and information. How far I have succeeded I leave you to judge. There is not enough to be tiresome, but sufficient to inculcate a spirit of emulation, so that the natural reticence and modesty of the average gas man may receive an impulse that will bring him on a par with his more favored confrere, and produce out of the whole what may be considered some capital ideas.

How simple a thing seems when you know how it is done. For instance, refer to Wrinkle No. 1 (see Fig. 1), to lengthening the life of

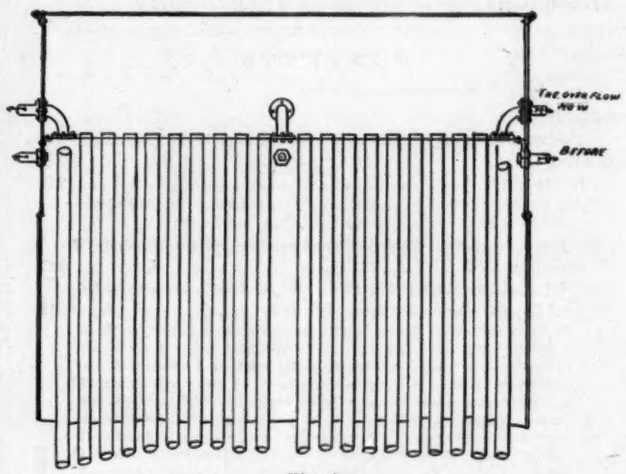

Fig. 1.

tubes in a gas condenser by excluding the air from the water space; but who has seized on the idea before? It reads thus:

The usual practice of providing overflows for water from tubular gas condensers has been to tap in below the angle iron which supports the upper tube sheet, thus leaving a space of at least 3½ inches which never becomes filled with water and remains filled with confined air. The tendency in a condenser with an overflow of this kind is for the tubes to become corroded at the upper surface of the water and in this air space. To guard against this, holes are cut through the upper tube sheet, and cast iron elbows are bolted on with tap bolts so that there is an upward pressure against the upper tube sheet, and the chance of corrosion is reduced to a minimum. Why, it seems as if one wouldn't build it any other way.

How many hundred tons of coke have been dumped to be quenched and forked (as is the practice) on the pile? Before, San Jose wheeled and dumped onto the pile without rehandling, as shown in Wrinkle No. 2 (see Fig. 2), as Mr. Gregory says.

The figure of the showerbath for quenching hot coke needs no explanation, as it is plain to be seen that the men do not have to let the retorts stand open while they cool the coke to keep from burning the barrows; but simply turn on the water and go back to charge the retorts and find the coke and wheelbarrows thoroughly cooled by the time they get through.

How many retorts have been condemned and thrown into the dump on account of disintegration of the mouthpiece end and destruction of the bolts? But Mr. Converse hit upon the idea represented in Wrinkle No. 3 (see Figs. 3, 3*a* and 3*b*), and explains his sketch thus:

In our regenerative benches we have burned off the bolts fastening

Fig. 2.

the mouthpieces to the retorts several times. In replacing them we were compelled to cut slots for nuts from the inside of the retorts. This weakened them so that on the second or third renewal the end cracked off. We have repaired a considerable number in the following manner,

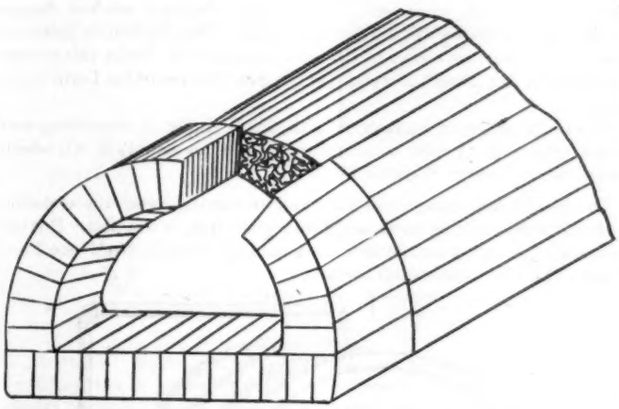

Fig. 3.

and so saved not only the repaired retort, but the life of the whole bench. We cut an even face on the broken retort and built in a brick front, using tiles or blocks for the bottom and fastened on the mouthpiece with an anchor bolt and clamps as shown in sketch. The anchor is caught in the front wall of the bench, the bolts are outside of the rim

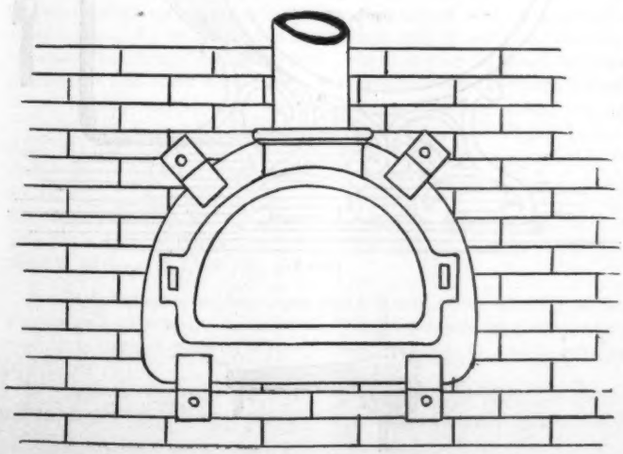

Fig. 3a.

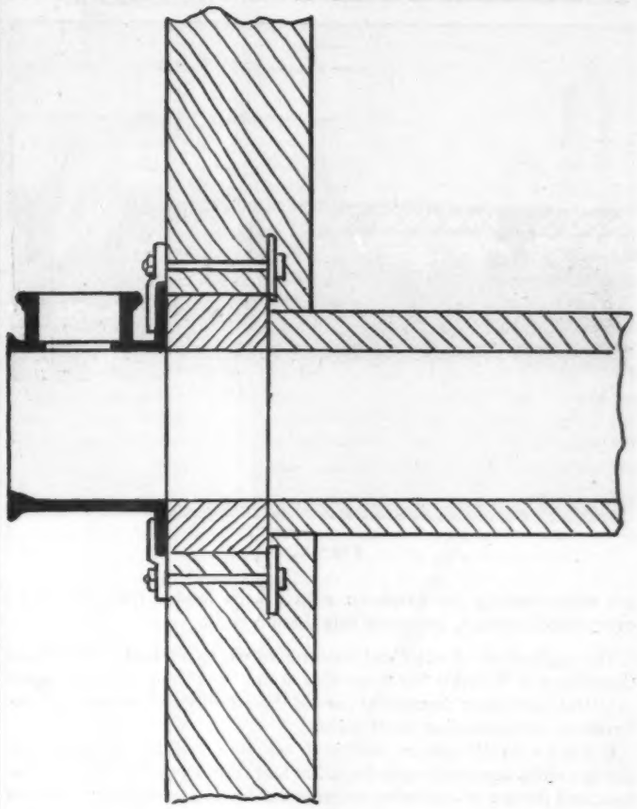

Fig. 3b.

of the mouthpiece and do not burn off. A number of these retorts have been repaired over two years and are still doing good service, already having made nearly 10,000,000 cubic feet of gas per mouthpiece.

It is all simple enough when you know how. And so we go on and on, and I ask you if this department is to be continued that you will favor my successor by delving into and through your experience, separating that which is novel or original and imparting it with the same willingness that you receive.

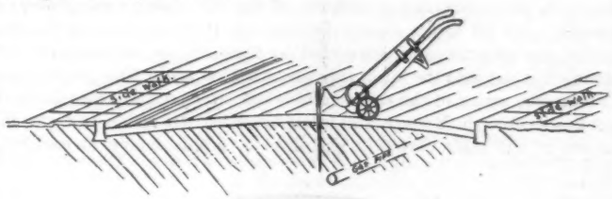

Fig. 4.

These ideas that crop out from that mother of invention, necessity, are the day dreams of one's think tank—that mystery, that womb of thought, man's brain. It is said that great minds seek the same channels, as you will observe, putting wheels to a lever that is used for drawing bars in street work. It was represented at the last Western Association meeting. I allude to Wrinkle No. 4 (see Fig. 4). It needs no explanation.

Fire is one of the things that every prudent gas engineer must guard against. Danger often lies in surrounding properties, buildings constructed of inflammable material in close proximity to gas holders. Mr. Gregory has hit upon a unique, and I think effective, Wrinkle to protect his company's property from such exposure. It is best understood by examining Fig. 5.

The photograph taken from the top of the holder shows a shower of water falling on the holder from perforated 2-inch pipe running along the top of as much of the holder frame as is in close proximity to wooden buildings. Should the buildings take fire, we expect the shower of water that we throw on top of the holder to spread all over the side as it runs down and protect the holder from damage while the buildings are burning. It is also a first-class means of reducing temperature of

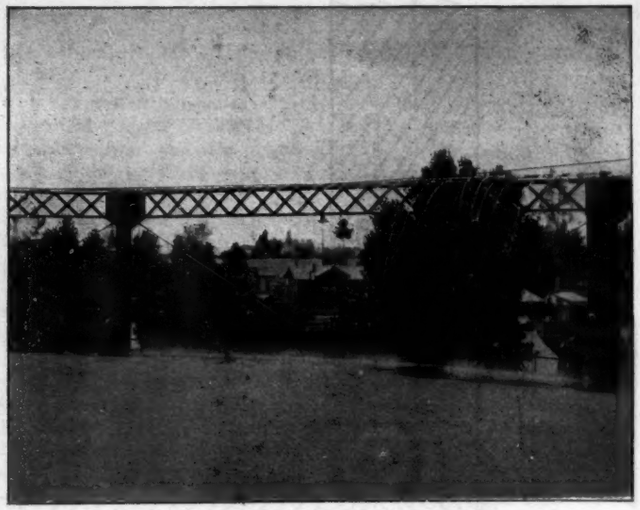

Fig. 5.

gas while waiting for sundown with a high holder ready to blow; everybody knows it, but everybody doesn't do it.

The application of relief and vacuum valves to oil tanks constitutes the subject of Wrinkle No. 6 (see Figs. 6 and 6*a*). The reasons given are excellent, and show thoughtful care of the guardian of a company's interests to use precaution at all points.

It is not a novel custom, nor is it common practice, to protect oil storage tanks against danger from fire and from loss of oil by evaporation, and danger of explosion by reason of having an explosive mixture of air and oil vapors above the surface of the oil and open to the atmosphere, by carrying a pressure of gas above the oil and having a gas-tight crown to the oil tank; and it was not the intention of the writer to describe the utilitity of this method of protecting tanks, yet, in order to intelligently describe the pressure and vacuum valves, it may be well to do so. Where oils containing light vapors are stored in tanks open to the atmosphere, there is a continuous loss of the most valuable components of the oil from evaporation. The space in the tank above the oil is constantly filled with oil, vapor and air, and when oil is pumped into the tank a portion of this vapor is driven out into the air, where, when oil is pumped from the tank, a corresponding amount of air is drawn in and intermingled with the oil vapor, forming a dangerous explosive. All oil tanks should be connected by a good-sized gas pipe under gas pressure and connected to the crown of the tank, so that, when oil is put into the tank, oil vapors back up into this gas pipe and into the gas mains of the works, and when oil is pumped from the tank gas flows through this pipe and takes its place. In order to make the crown of the tank perfectly gas tight it is customary to carefully paint the seams and rivets with a mixture of black oxide of manganese mixed with shellac. This is quick setting and is not soluble in oil. It will be readily seen that, to connect an oil tank with the gas pipe as described, elements of danger arise. First, the gas pipe may become stopped, so that when oil is being pumped from the tank a partial vacuum will be formed under the crown, causing the crown to collapse. To prevent this an ingenious vacuum valve, controlled by a spring and adjustable to open at any vacuum desirable, is used. This valve is shown in Fig. 6*a*. Again, should there be any stoppage in the gas pipe while oil is being pumped into the tank, or should the size of the pipe be inadequate to carry away the vapors as fast as the oil is pumped, a corresponding pressure valve is used. This is also shown in Fig. 6. The valves are made of brass, are protected by hoods to keep out all dust and dirt, and, when used, are a perfect safeguard against danger to the tank by reason of vacuum or pressure. They should be bolted on the tank as near the center of the crown as possible. These valves were designed by Mr. Frank Feveaux, of the San Francisco Gas Light Company.

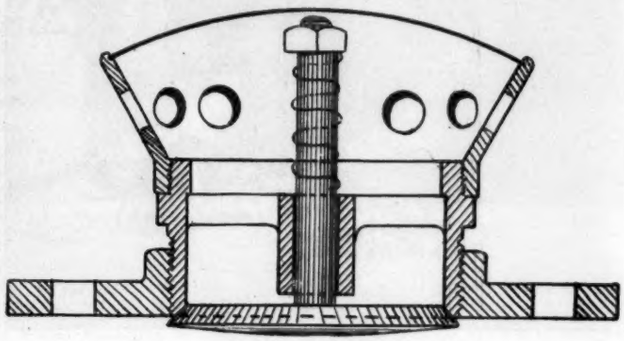

Fig. 6a.—Vacuum Valve.

The recipe given in connection with this Wrinkle is something well worth retaining. I refer to the paint mixture not soluble in oil, which constitutes a distinct Wrinkle by itself.

The idea of maintaing a constant and unvarying water line in station meters, thereby giving more accurate registration, is not new. But the manner of adapting an old idea is, as seen in Wrinkle No. 7 (see Figs. 7 and 7*a*). The pictures tell the tale.

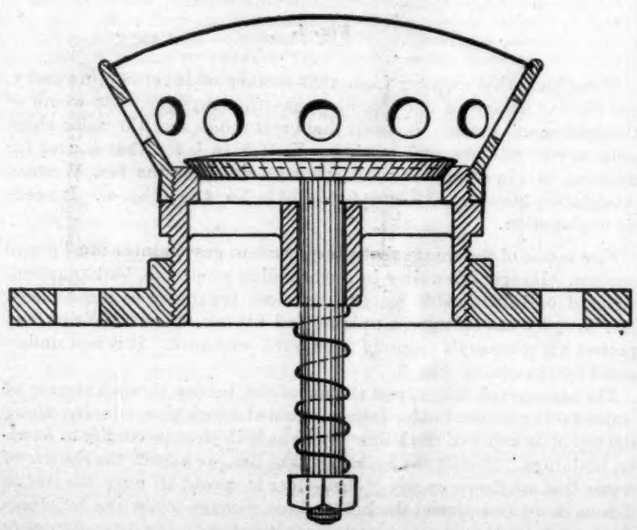

Fig. 6.—Pressure Valve.

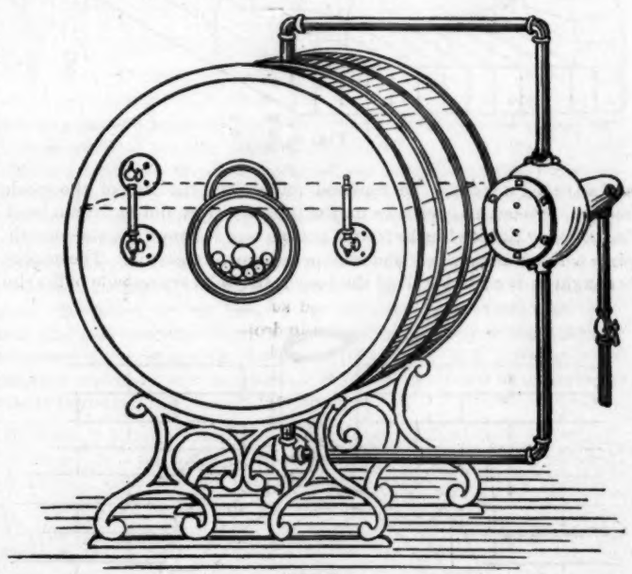

Fig. 7.

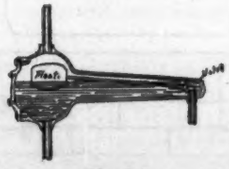

Fig. 7a.

That familiar and unwelcome visitor that has made its presence known ever since the advent of high heats and large yields, denominated as the "Gas House Devil" (naphthaline) has been amply provided against by the cute contrivance represented in Wrinkle No. 8 (see Fig. 8). It is explained and described as follows:

Apparatus for the Prevention of Naphthaline Stoppages.—By Mr. E. C. Jones. It has been demonstrated that the vapor of naphtha held in suspension in a current of gas will dissolve and prevent the deposition of naphthaline crystals. It is well known that naphtha is used to dissolve naphthaline crystals from the riser pipes of lamp posts, from the inlet and outlet piper of gas holders, and, in fact, at any vulnerable point in a gas works. This application of naphtha is purely local, and must be repeated as often as naphthaline is redeposited. The simple apparatus described and shown in Fig. 8 consists of a small naphtha tank, which is preferably placed at any point in the open air, and is connected by an outlet pipe with a small gas sight-feed. This is provided with the gas pressure pipe and suitable valves and connections, so that naphtha may be distributed in drops of any size at any part of a gas works. By referring to the sketch, it will be seen that there is a convenient means of filling the tank, which is also supplied with gas pressure so that there is no loss from evaporation, and the naphtha tank is not in any way open to atmospheric interferences. Also a gauge glass on side of the tank shows the amount of naphtha on hand at any time. It has been found that by applying this simple apparatus to the outlet pipe of gasholders supplying gas directly to the city mains, and while gas is passing through the pipe, admitting a few drops of naphtha each minute, that trouble from naphthaline stoppage has been reduced to a point where it is no longer troublesome, and is not a black beast to be dreaded from year to year.

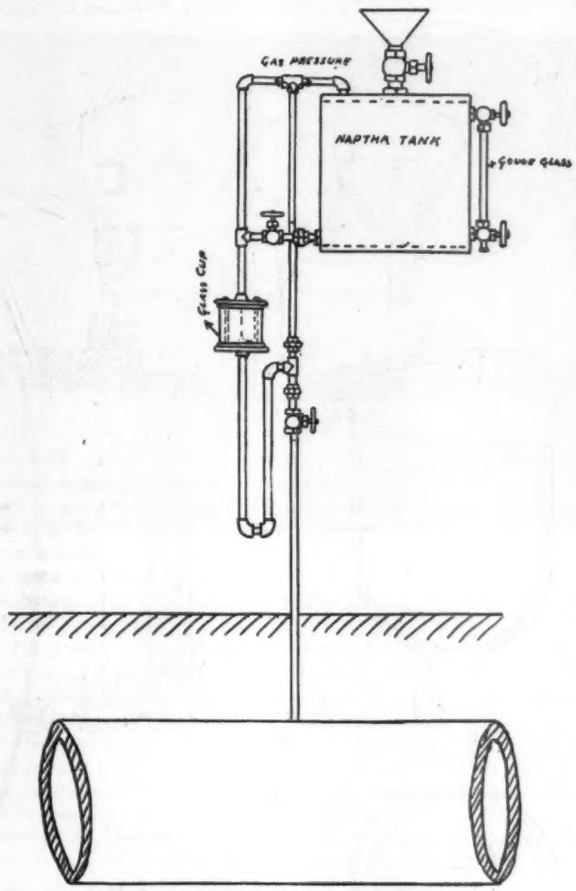

Fig. 8.

The little agitating point to keep free the vent of tar burning pipes is simple and effectual. It accomplishes the purpose as shown, and is worthy to take its place as Wrinkle No. 9 (see Fig. 9), and is described as follows:

We made a very convenient feeding and cleaning valve for feeding tar to burner by drilling a small hole through a ¼-inch cap, and then tapering a piece of spring wire, the tapered point running through the drilled cap and the handle bent up and held against the wheel of the valve used for shutting off the tar. The flow of tar can be nicely regulated by raising or lowering the tapered point. And cleaning the feed cap in the same manner.

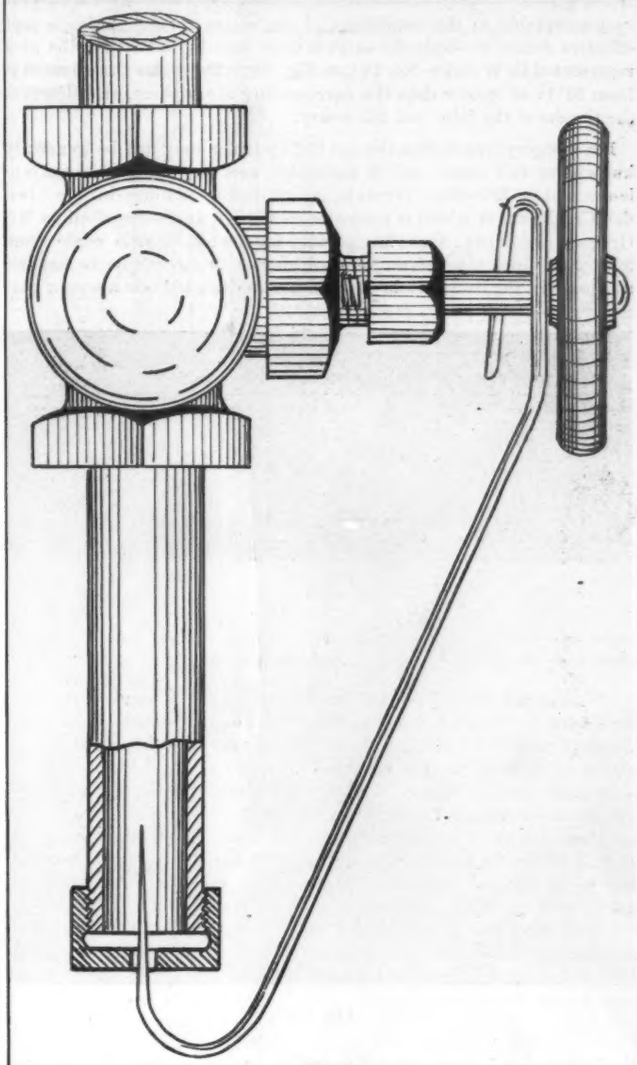

Fig. 9.

Mr. C. M. Converse says: In this beautiful State of magnificent climate, where the temperature sometimes is high, a cooling drink is often

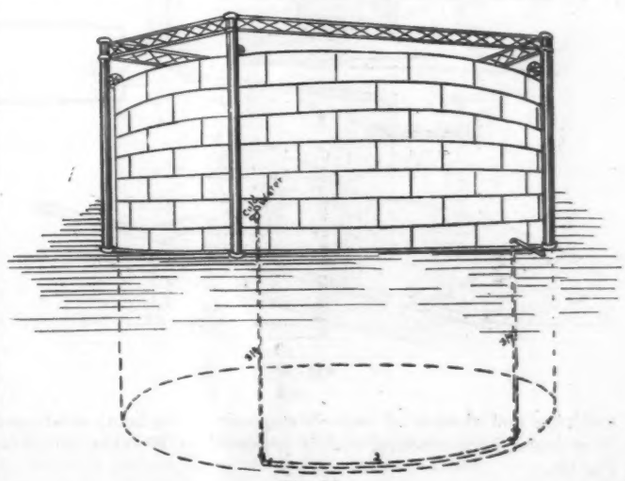

Fig. 10.

very acceptable to the employees of the retort room. A simple and effective notion to obtain the same is to be had by following the idea represented in Wrinkle No. 10 (see Fig. 10). The water thus treated is from 20° to 40° cooler than the surrounding atmosphere, and deserves the thanks of the faint and the weary.

Mr. Gregory avows that the test light purifier may not be generally known on this coast, and is submitted as a very acceptable convenience and a first-class Wrinkle, as proved by its use in the Garden City, a cut of which is presented in Fig. 11, and is described by Mr. Gregory as follows: Our little purifier for the test light is made from a piece of 4-inch pipe, about one foot long, with cap, stopcocks and drip as shown in the illustration. A little sack of lime rests on a screen near

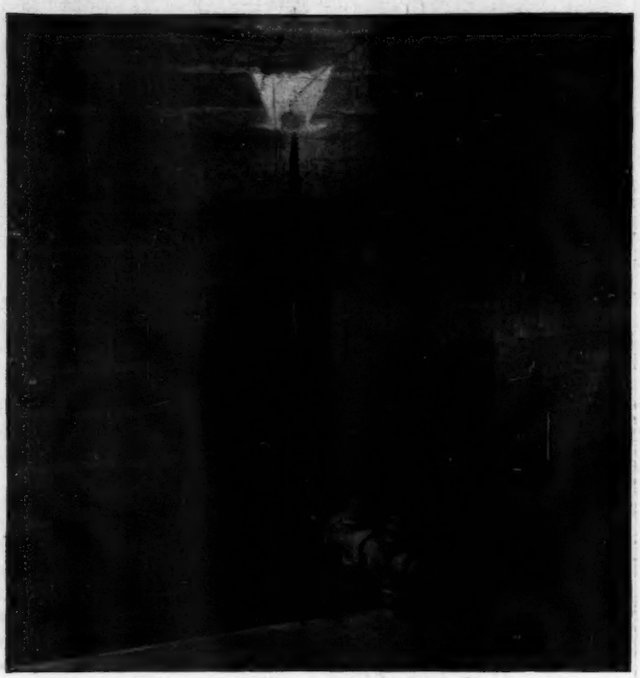

Fig. 11.

the bottom and is large enough to fill the purifier so that the gas cannot pass up the sides but must go through the lime. This purifier is attached to the main, close to the outlet of the exhauster, and shows the quality of gas as it comes from the retorts without the delay occasioned by passing gas through 50 or 60 feet of pipe from the other side of the large purifiers.

The manner of revivifying oxide in use at Santa Cruz, Cal., is submitted by Mr. C. E. Lilly. It has the novelty of an adjustable slide on

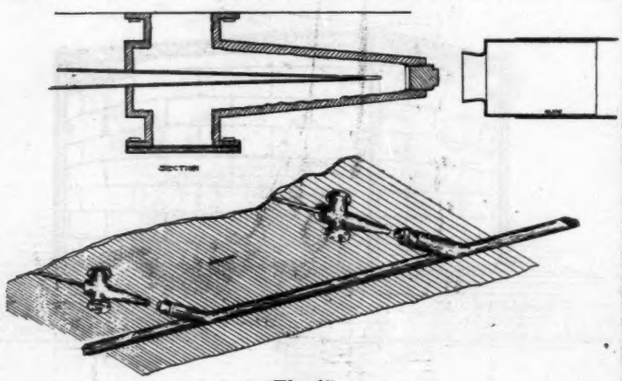

Fig. 12.

exit pipe and absence of valve or stopcock, a plug being substituted. It is found very effective, and is presented as Wrinkle No. 12 (see Fig 12).

The adaptation of the wedge principle to substitute the screw for quick adjustment and substantial service is an acceptable Wrinkle, and brings comfort by its application for the purpose named. at least so says Mr. Richard Fenner, who thus describes it. It is numbered Wrinkle No. 13 (see Fig. 13):

Inclosed find a sketch of an oil cup which we have used on our gas exhausters for several years with perfect success. The old oil cups had a screwed cap, which, by the action of the gas and the constant use,

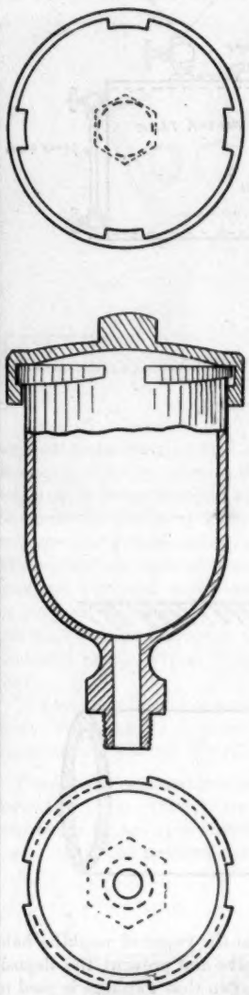

Fig. 13.

wore out in a very short time, while to this style of caps there is hardly any wear and tear. They are easy to put on and have proved to be perfectly gas tight. I am going to apply the same principle to the air plugs of our purifiers, which are all more or less worn out, and had to be renewed twice in five years.

The improvement in construction of gas generator doors is manifestly made plain by the practical ideas presented in Wrinkle No. 14 (see Fig. 14), by having the door frame in sections, thereby obviating the nuisance of leaking doors, and by affording an opportunity to remove the faulty section and correct imperfections that affect its proper working or placing a duplicate in its stead.

The usual method of riveting a door frame to the shell of a water gas generator is much improved upon by having the frame cast in two pieces, one piece being riveted to the generator while the other is bolted to this piece. It is also an advantage to use a light door, lined with asbestos cement instead of the cumbersome firebrick which has been used heretofore. Asbestos cement is made to adhere to the inside of the door by means of a piece of wire gauze of about ¼-inch wire fastened to the door by tap bolts, which acts as a lathing to hold the asbestos cement in place. Instead of having a full bearing between the door and frame it is an advantage to have a narrow chipping strip, about ⅛ of an inch wide, on the door frame and a groove cut in the face of the door, which is filled with Babbitt metal, and when screwed against the chipping strip it makes a perfectly tight joint against steam, hot water or gas, and, in practice, it has been found to be very durable.

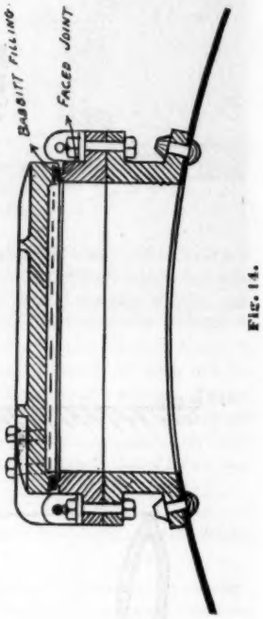

Fig. 14.

Mr. Gregory, in Wrinkle No. 15 (see Fig. 15) gives us an account of the difficulties encountered in maintaining mouthpieces in position after the bolts are burned off. This is incidental to all benches, but in his case, with self-sealing lids, the mouthpieces being excessively heavy require special consideration.

He says: The mouthpieces of our retorts weigh about 400 pounds each. When the bolts which hold them to the retorts become burned

Fig. 15.

they begin to creep away from one side or the other or from the top. To prevent this we had jackscrews made from 1-inch round iron, with long thread set into 1¼-inch pipe, out of which it is lifted by a nut resting on the end of the pipe. These jackscrews are tightened under the mouthpieces to remain wherever a support is needed. We not only keep the mouthpieces supported from below, but we also place the jackscrews between long lines of strap iron and the flanges of the mouthpieces, thereby keeping them screwed back to the ends of the retorts, as shown in the cut. The strap iron is firmly anchored to the outer walls of the benches.

I think if Mr. Gregory will hold a little conversation with the gentleman from the Potrero the Association will reap the benefit.

A neat Wrinkle is No. 16 (see Fig. 16). It comes from Santa Cruz in the shape of a charging car used in charging upper retorts, the stoker

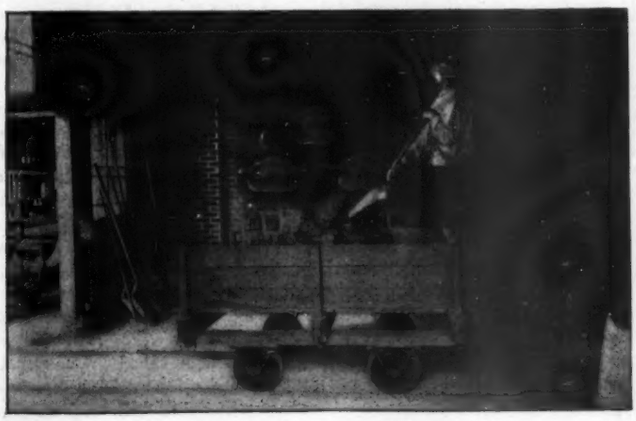

Fig. 16.

standing in car while putting in the charge to get the benefit of elevation. It has also had the merit of leaving the floor space clean for work.

Wrinkle No. 17 (see Fig. 17) shows a common galvanized iron closed boiler, say 30 gallon, which comes in good play as a pressure pot to free sagged pipes from condensation or other deposits where the drip pump cannot be made to do service, such as at river crossings that have shifting bottoms or other conditions where pipes have become obstructed.

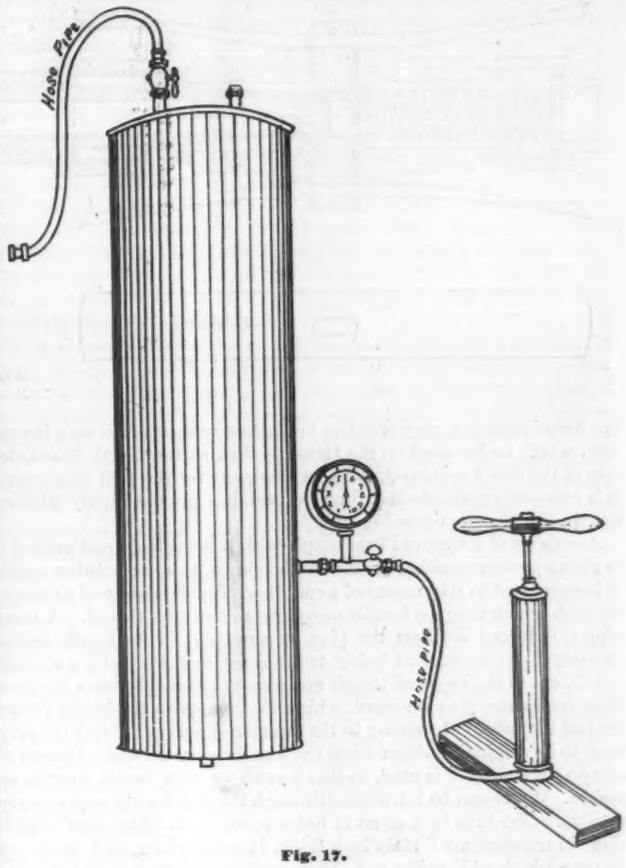

Fig. 17.

Having occasion to set an 80-light wet meter in a contracted space, and not wishing to have the flow checked by angles to overcome a consequent trap in the connection. What you see in Wrinkle No. 18, as

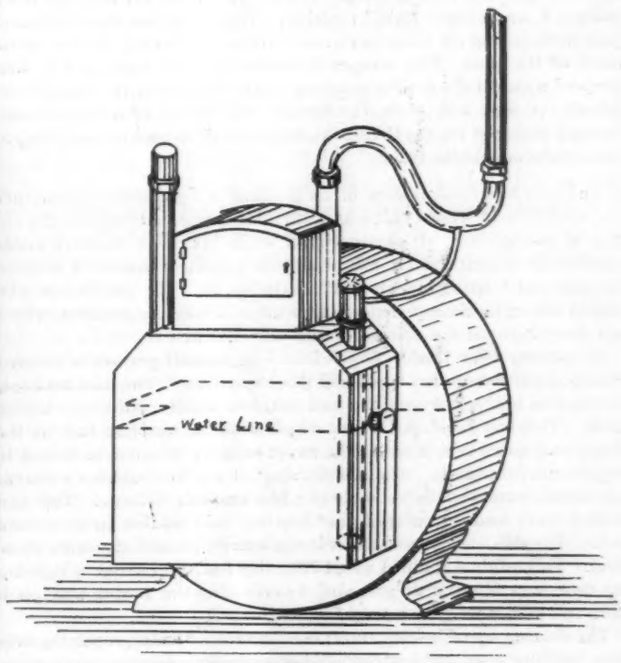

Fig. 18.

outlined in Figure 18, was followed by a satisfactory result—*i. e.*, taking the drip into the filling screw from the connection.

Mr. A. J. Vanderwhite wishes to call the attention of the members of

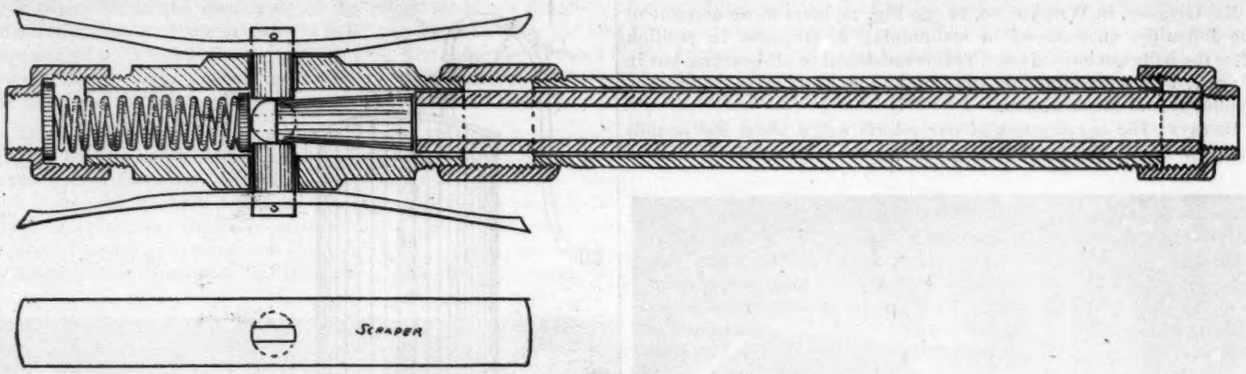

Fig. 19.

the Association to a very effective boiler tube scraper of his own invention, which he has used on the Heine boilers at the North Beach station of the San Francisco Gas Light Company for the past two years. It is exceedingly simple and durable, and has proved highly satisfactory in every respect (see Fig. 19).

A consists of a wrought iron nipple with a metal body cast around it to give a greater working surface to the pins *a*, *a*, *a*, *a*; another nipple *B* is connected to it by means of a coupling. To this is screwed a reducer through which the pipe handle moves on a continous thread. A taper plug *C* is forced between the pins by screwing up the handle before mentioned, its movement being transmitted to the plug by a straight rod *D*, cut to the required length and loosely inserted between the two. This forces the pins outward, which in turn press the blades firmly against the tube. The spring in the cut merely serves to drive the plug back to its original position when the handle is unscrewed. Instead of a cap at *E* a reducer is used, so that a swab or wire brush may be attached. Water can be introduced through the pipe handle and sprayed into the boiler tube by a series of holes bored in *A*. The steel cutters (four in number) are 3-16ths inch thick, 7½ inches long, and must not be over ½-inch wide at the end. These ends are rounded to fit tube, and are so beveled that the sharp edge comes in direct contact with same. When dulled by constant use it is an easy matter to remove and sharpen them. In the full length of the blade (*i.e.*, 7½ inches) there is an upward curve of at least ¼ inch. They are attached to the pins in the manner shown in the drawing. Wires are passed through the holes marked *b*, and loosely linked together. These prevent the blades and pins from falling off when not in use, without hindering the free movement of the pins. The scraper is inserted in the tube, and is then screwed up until the desired pressure on the interior of the tube is obtained. A lock nut *F* on the handle will hold it firm while in use. Though designed for the Heine, the scraper may be used on any straight water-tube or tubular boiler.

And now to a reminiscence of an incident in a gas man's experience —I wish to read what I think as a Wrinkle is unprecedented in the annals of gas lighting. It shows what a fertile brain can conceive under adverse circumstances. It will produce a wrinkle wherever it is heard or read, and I denominate it as Wrinkle No. 20. The gentleman who passed through this experience is a member of our Association, who I am sorry to say is not able to be with us. The title is:

Supplying Gas Under Difficulties.—In a small gas works which I manipulated some years ago I had this experience. The inlet and outlet pipes of holder were set in a cast iron box wholly within the holder tank. This box developed a leak which admitted water as fast as the drip pump could take it out. The retort capacity was not sufficient to supply the consumers. The remedy applied was to construct a canvas gas holder somewhat in the style of a blacksmith's bellows. Top and bottom were made circular of pine flooring, laid double in white-lead paint. The side was covered with canvas heavily painted also with white lead. This affair contained about 700 cubic feet, and about at lighting up time was filled with gas, and, by crowding the retorts with pitch pine and tallow we gave a very fair service.

The shoring up of holder, emptying the tank of water, repairing drip box, refilling tank and putting holder again in operation were mere mechanical details, which, however, took about a week to accomplish. In my haste to get gas into the holder I left in too much air, and that night consumers had no light, though there was plenty of highly diluted gas. In over thirty years' experience that was the only night I failed to give satisfactory service.—C. E. Burrows.

Rusting Purifying Covers.—A note or two from Mr. Burrows' diary: August 28.—Found one of the purifier covers rusted through in several places. Painting, which has been my custom, does not seem to save them. After repairing have poured petroleum oil on top of water and hope thereby to prevent rust. *Some months later.*—The above remedy seems to be effectual.

An Emergency and Pitch Pine.—I make a point of keeping a small stock of dry pitch pine on hand, and have sometimes been saved from disaster by so doing. Our holder capacity is only 13,000 cubic feet at this place. We were putting out about 28,000 cubic feet per day with a five-retort bench, which was rather aged. Early one evening a large piece dropped out of the top retort, reducing our producing capacity 20 per cent. Pitch pine, however, saved us, though at midnight the holder was out of sight (our tank stands six feet above ground) it did not touch bottom. Soon after midnight the holder took a turn upward, and I "took a rest."

This, gentlemen, concludes my endeavors to glean from among you all features that are not generally known and are very pleasing and acceptable to the practical gas works manager, and often give rise to the query why it was never thought of before.

Whoever conceived the Wrinkle as constituting a part of the proceedings of gas associations is deserving the acknowledgement of gratitude of the whole fraternity, as it has formed a department where theories are absent but facts prevail. It places in practical lines what would have remained isolated and obscure.

I heartily thank the several gentlemen who have so kindly assisted in making this our our first attempt to develop and glean a few Wrinkles for the P. C. G. A. I thank you for your attention.—T. R. Parker.

Mr. Clements moved a vote of thanks to Mr. Parker for his very interesting contribution, and Mr. Eastland suggested that the sense of the meeting be that Mr. Parker have no wrinkles upon his brow caused by either grief or care. The motion was carried unanimously.

Mr. E. C. Jones—In regard to the Wrinkle by Mr. Burrows, for protecting the side sheets of purifier covers, I would like to suggest a method in very successful use in San Francisco. The side sheets of purifier covers are apt to corrode at or near the water line, and we find that, by cleaning the iron and coating it with a mixture of white lead and tallow, painted on the side, that it will effectually prevent any corrosion. This must be repeated from time to time, as, of course, the mixture of lead and tallow never sets; it is always in a "tacky" state. Our method is very simple and economical. In an ordinary iron kettle we place beef tallow, heating it over a stove of any kind until it is boiled. Then we strain the tallow through a piece of gunnysack or any kind of coarse cloth, into a dish, which is kept surrounded by hot water—an ordinary 5-gallon can immersed in a water bath; for instance, a tub of hot water. We then mix white lead with beef tallow to a consistency that it can be applied with a brush. This, upon being applied to the purifier cover, will set to about the consistency of tallow itself, or a little harder. Care should be taken, however, in mixing the materials not to heat too much, as it is not advisable to re-heat the substance. This means the saving of a great many dollars in preserving the iron.

Mr. Parker—About 30 years ago we adopted the tallow plan described by Mr. Jones for the sides of the purifier covers. I tried white lead at first.

Mr. Britton—I listened with much interest to Mr. Parker's Wrinkle presentation, and I always read with interest the Wrinkle column in

the published proceedings of other Gas Associations, and I want to say here that no other department has treated upon any more important points than this.

The Secretary then read the paper by Mr. E. C. Randall, of San Jose, Cal., entitled :

ONE YEAR'S EXPERIENCE WITH WELSBACH BURNERS.

In reply to the complimentary request of your officers, I take great pleasure in presenting my paper. Passing by the construction and the detail of the different parts of the Welsbach lamp, for the purpose of facilitating matters, we will call it a Bunsen burner, having from 3 to 3½ cubic feet consumption per hour, which, when used with the improved 169, or "Wagton mantel," produces from 60 to 65-candle power. Many of you are aware of this fact, but have you considered how 65-candle power can be obtained from so small a consumption? Has it an equal in an economical way on this Coast? Yes. If it has been your misfortune to have had similar experience to mine, where the electric people found it impossible by their schedule to meet my proposition, would they not make special rates—in some cases less than one-half their already low figure. Even with such great inducements, I was almost always successful in securing lighting.

I understand the mantels are composed of the refractory ores of the earth. After being formed into a solution, the vegetable composition is treated with it, then formed into shape by heat.

Durability of Materials.—I have only seen four which have been burned out. The one used most lasted 4,872 consecutive hours, exhibited in my office window. The one used least, in the some place, burned 2,700 hours. Some of my patrons have used their lamps continuously over one year without renewals. Although they appear to be in good condition after lengthy service, I notice when the lamps are lighted there is a slight diminution in illumination. On examining them I found they were shrunken fully three-eighths of an inch shorter, but were tougher and much more durable than when first used. I am positive the greatest cause of destruction is the fault of the consumers themselves, as it is only a matter of care.

Reviewing My Work at San Jose.—In handling the lights I had many prejudices to overcome. As the decided stand taken by the people was very discouraging my progress at first was extremely slow. Among the first objections was a comparison with the old mantel; then, the many gas saving appliances they had been humbugged into purchasing, the color of the light, breakage, and odor added thereto; the wild ideas and set prejudices the public have against gas generally. The financial objection was at first the most difficult. In overcoming this rough spot, I changed my system by proposing to them an earning proposition.

I wish to show additional obstacles, among them the current prices for illumination in San Jose. We have two electric lighting companies, one operated by the Gas Company, which was compelled, owing to opposition, to sell its current at a low figure, as the following rates demonstrate: Electric arc, 11 to 1 P.M., $1.50 and $2, respectively, per week, with one or more additional incandescents free, as the case might be. Incandescents, 16-candle power, 12 o'clock and all night circuits, from 15 to 25 cents per week. Gas, $3 per 1,000.

Returning to my earning proposition. When I had a customer who wished to take the benefit of my proposition, I used the expense of his electric account as a working basis. Say he was a Mr. A., then I supplied him with lamps to duplicate his illumination, furnishing sometimes his plumbing and gas fixtures. At the end of each month, after deducting his expense for gas, the balance was applied as part payment for lamps and fixtures, as the case might be. The results of this proposition as to his earnings have averaged from 60 to 90 days; in a few cases lamps have earned themselves out in one month; in only one case have I been caught. This I trust you will not press me to explain.

The following estimates are taken from business places only, showing the results of Welsbach lights against electricity. Handicapped as we have been for supplies during the months of November, December and January last, my data for the first estimate shows 109 electric arcs and 587 incandescents displaced in 133 places. Next, the new places opened during this time were 59; 54 adopted Welsbach lights, 5 electricity. My next is a comparison between Welsbach lights and electricity for our present illumination in business places, inside lighting only. In doing this I have estimated 4 Welsbach lights to each arc and 3 incandescents to each Welsbach. The number of arcs remaining is 101, and would equal 404 Welsbachs and 381 incandescents. I make an allowance of 100 incandescents, to be sure of being just and fair, and 250 for the Hotel Vendome, making a total of 731, which equals in above proportion 243¾ Welsbachs. A grand total for electricity of 647¾, while the Welsbach has 1,343, double both electric companies. Further proving my demonstrations to be correct and not overestimated, we will take the number of customers each has: Electricity, 102; Welsbach lights, 215. The changes made from coal oil to Welsbachs are 45, who use 163 Welsbach light lamps. The losses sustained by Welsbach during this time were 24, 3 going to electricity, 21 retiring from business.

If I am informed correctly, there is a very large discrepancy to be accounted for in incandescents still. In March, 1894, I am informed, there were in use 4,300 incandescents. My present estimate allows 731, but it does not include city contracts or private house lighting, so to be liberal, double my estimate of 731 and allow 1,462. This subtracted from 4,300 leaves 2,838. Again, subtracting the 587 of my estimate from 2,838, leaves 2,251 unaccounted for. Referring back to the 1,462 allowed, compare it to the 4,300 of March, 1894, and a loss is sustained of over 60 per cent. in incandescents.

On account of outside lighting and the many changes, I am unable to show the loss in arcs correctly, only so far as my data of those displaced, 109, and the 54 new business places; on a conservative estimate it would reach 200 at least, while the actual loss is considerably over that amount. These estimates do not include city contracts.

The Welsbach light has changed the condition of the illuminating companies in San Jose. A few years ago, the Gas Company, to protect itself, had to purchase and erect an electric plant, which put it to considerable expense; and, until the Welsbach light was introduced, progress was slow for them. To-day the opposition electric company, to protect its electricity, proposes to build a gas plant. Why? Welsbachs are too much for them. This is the first electric lighting company in the United States to employ gas as a weapon against its own industry.

Street Lighting with Welsbach Lights.—I believe it is only a question of time when extra distribution and a more economical light will be required and demanded by the taxpayer. Its success is by no means an untried or undemonstrated fact. In Europe street lighting is done extensively, and in referring to my own work at San Jose, I have now about 40 outside lights, and the results have been about the same number of mantles destroyed as among those used for indoor illumination. The gas manager should feel enthusiastic at the prospects in this field, as a firm fixture is all that is required to protect them from the wind, and it is immediately a success. They can easily be protected from rain, and with a bye-pass, maintaining a small light to preserve heat, from dampness. In conclusion, I feel confident respecting the future of the Welsbach light, if it receives proper attention. I also think it absolutely necessary that the gas companies of the Pacific Coast act in harmony with the Welsbach Company, as it is to my mind only a question of time when the Welsbach lamp will be universally used, and the incandescent electric light will rest in the residence of "Old Dog Tray."

Discussion.

Mr. Meyer—Gentlemen, I would like to express my obligations to the author of the paper, which is very explicit in every respect. It could not be better. It goes into details which I intended giving. I have here a letter from Mr. Grant, of Modesto, Cal., to whom I wrote about the Welsbach burner, asking what he had been doing with it in the past two years, and I will ask the Secretary to read this communication which Mr. Grant sent me.

The Secretary then read the letter from Mr. Grant to Mr. Meyer, as follows :

"In answer to yours of July 10th, it will be impossible for me to attend the meeting of the Pacific Gas Association, although nothing would give me more pleasure; but the fact of the matter is that, since the introduction of the Welsbach light here, I feel as though I could not spare the time for anything else but the interests of my Company, and this can only be done by being personally on the ground. I have endeavored for some time past to take a vacation, which my Company is perfectly willing to afford me, but after winning a hard-fought fight with the electric light company, I feel as though I would not be justified in leaving my duties in the hands of *anyone*, because I know that the business could not and would not be attended to as I have attended to it, and hence could not enjoy a vacation. Now, this is all due to the attention required by the Welsbach light, which I personally supervise myself. This I have found is the only correct way in which we have successfully regained our business. The history of our competition commenced in April, 1891, when the electric light company's plant was put in operation. People flocked to the new light, almost leaving the Gas Company deserted—I should have informed you that I resigned my services to the Gas Company in 1890, but returned to its employ in January, 1892. The Gas Company, up to November, 1891, had the contract to light the streets at $4 per lamp per month, which was done with the open burner. In November, 1891, our intelligent Board of City

Trustees awarded the street lighting to the electric light company, at $6.50 per light per month, although the Gas Company agreed to do it for $4. This same thing was done in November, 1892, the Gas Company being virtually ignored, but this perhaps was due to the Company's refusing in its bid to furnish any new lights at any great distance from its mains. During the year 1893, the Company and myself had many consultations with respect to making a determined stand for the street lighting in November, 1893. The bids were to be opened on said date. Just a few days before the bids were opened I sent and obtained from you one No. 28 Welsbach light. This I placed in a street lamp, and lighted it for two nights. It was, with but a few exceptions, admired by all. The electric company's bid was the same as ours, they agreeing to furnish a 32-candle light and we a 64-candle light. The contract was let to us. Then the electric light company's fight began, but they reckoned without their hosts, although they at one time during the fight had us nearly conquered. They sent a special agent to canvass for our consumers, making ruinously low offer of rates, and, as is natural, the dear people flocked to the electric light, leaving us only a very few business houses. These we managed to keep on probation, and on these terms only; if after one month's trial these consumers were satisfied with the Welsbach light and the price therefor, they would continue to use gas, otherwise they would transfer their lighting business to the electric light company. When the month rolled around the electric light people were the first to make inquiries from the probation customers respecting their bills, and, when informed, the electric people told the consumers to keep on with gas, for they could not furnish them as cheap a light as the Welsbach light. This was their death blow, and instead of doing us up completely, they found us a pretty lively corpse. They had contracted with their consumers, or rather their consumers had contracted with them, to pay, in some cases, as low as 50 cents for an *all-night* light. Notwithstanding the low prices and the obtaining of nearly all the lighting business, after about one month's trial they gave notice through the paper that they could not and would not furnish electricity for lighting after midnight. In consequence of this, people who used all-night lights flocked back to gas, and from this on, we being in a position to furnish a never failing, cheaper and better light, continued to draw from the electric company's consumers, so that when November, 1894, arrived, the electric company was nearly annihilated, as we were in November, 1893. Last October they again competed for the street lighting, and we again beat them. On November 1st they closed up shop, going out of business. We presume they will give us another shaking up next fall, but we will be prepared for them. This makes us more vigilant than ever, and hence my reason for wanting to stick closely to business until after the next street lighting contract is awarded. When the competition, or rather the battle of annihilation, came on in November, 1893, we agreed with our customers to sell gas at $4, with a 25 per cent. cash discount, to furnish Welsbach burners free of charge to all, and also keep them in repair, or rather to furnish renewals. This we have done up to date, at a great expense to us. Our consumers up to present have been very destructive of chimneys and mantles, but threatening to charge them with renewals, they are now a little more careful. When they do have to pay for them, then the time will come when they will gladly follow out instructions and save themselves expense, for they admit that a cheaper and better light cannot be had. Of course there are exceptions to this opinion. It is cheaper than coal oil. We have tested the burner time and time again, and with gas equal to $3 per 1,000 cubic feet and the burner consuming only 3½ cubic feet per hour, which amounts in value to 1 cent. per hour, no gas company need fear competition when using the Welsbach burner. In order to make said burner a success, the gas companies alone should handle them, for it would be to their interest, as it has been to ours, to give the burners their personal attention. Where there is a gas company and an electric light company in a town, both distinct concerns, I feel that, with my limited knowledge of the Welsbach burner, I could go into that town, and, with the co-operation of said gas company, the electric company could be knocked out in one year. I consider that the mica chimney is an improvement on the straight glass chimney, but the Paris chimney is the best one now on the market. We like it best, and have 12 now on trial in our street lamps; and whilst we do not know for a certainty that they increase the candle power, yet the light therefrom seems improved and has been publicly commented on. The penetrating power of the light seems improved, and whilst it may seem strange to you, yet I have won several drinks on the distance the time of night can be read on a watch. At different times the time has been read at 400, 500, 600, and nearly 700 feet; and the darker the night the better we like it. We use a street lantern similar to those used in San Francisco, although they are not the best. In some instances the consumption of gas has been increased with some consumers, but in others, on account of the high candle power of the Welsbach burner, they use a less number of burners, and hence less gas. Our consumption is about double now what it was 12 months ago, but this is attributed to obtaining the electric company's consumers. We are sending out a good amount of gas, but at present price therefor are not getting very rich. This we will have to grin and bear for a while. We obtain consumers for gas (coal oil fiends) used with Welsbach burners that we could not have possibly obtained otherwise. I cannot understand why gas companies have not taken hold of the Welsbach more freely, for, everything considered, it would have been to their interest. Again regretting my inability to attend the meeting of the Association, I am, dear sir, yours truly, E. P. GRANT, Supt."

Mr. Meyer—I wish to add that it has been my wish to get all superintendents and gas works to handle those burners for two years past. Mr. Jones permitted me to put a few burners down here, and Mr. Grant is one who fortunately took hold of it. Other gentlemen here have handled the Welsbach burner quite successfully. From October to about the 1st of March we could not get enough mantles to place them. It was simply renewals. We could not get any new lamps. San Francisco has about 12,000 to 14,000 lamps to-day, and we could have placed about 30,000 if we had had the mantles. I am always there to show that gas goes against electricity. We sell burners complete, everything ready to put on. That is the instruction to all agents. The renewal depends entirely on the handling. In some places we have to renew mantles after only a single day's use of the burner, and we also have places where we have not gone in a year. On an average I should say that there should be two mantle renewals per annum. I have used them at home myself without changing for 2½ years, and my children use them. The lamp as it stands to-day cannot be better in candle power. We have gone so far as to place the lights in for three months, on trial. We have now taken a contract with Wells, Fargo & Co., and it is for them to say whether they desire to accept them or not. That contract is for three months, but I know that such a thing as their not wanting them will not occur. Two or three hundred dollars would be a safe investment in lights for a small gas company. In one place on the Pacific Coast they have placed them in against the low priced electric lights. I find that whenever a small gas company uses these burners they are requested to place them in very largely. In every place the gas company is supposed to supply all these things. They must protect themselves against electricity. If everybody had used these burners when I advised it two years ago, there would have been a great deal less opposition now from the electric light. In some instances I find it easy to displace electric light with gas. In other instances they prefer the incandescent light because it is easier to light. We placed 17 lights in a store on Market street, San Francisco, and in one month the proprietor saved $60 by their use. He saved $20 more than he had to pay for the entire lamps. Wakelee & Co., druggists, at Bush and Montgomery streets, in this city, had Welsbachs placed in their store at a cost of about $77, and they saved something like $85 for the past month. I have taken a contract to supply them with mantles and chimneys at $2.50 per month, for one year, and I see that I do not lose by that. The cost of repairs will be about 9 or 10 per cent. I find some trouble with a bye-pass attachment. I do not consider it necessary to the success of the burner. It amounts to about 25 feet per month. I have not made tests of that. In another place in San Francisco we took out three arc lights. We placed 10 lights in the place where he used to pay $13.80 per week for electric light, and our change reduced his bill to $6.80, and he had a more satisfactory light than before.

The President—I suggest, gentlemen, that as the hour of adjournment is near at hand, we had better continue this discussion until to-morrow morning, as we have something else that should be taken up before adjournment for to-day.

On motion of Mr. Eichbaum a vote of thanks was tendered to Mr. Randall for his paper.

AN INTERLUDE.

The President—We have with us a gentleman who is, I might say, the Nestor of the gas business on the Pacific Coast, for he started the first San Francisco gas company, and I dare say he can hardly recognize his own picture, which appears in this group of four before us, all of whom were concerned in the first company here. We are all comparatively juvenile members, and I think it proper to call upon him for a few words respecting his pioneer experience leading up to the present glorious development of the gas business, and its condition on this Coast. On behalf of the Association, I ask Mr. Eastland to say a few words.

Mr. Eastland—Mr. President, and Gentlemen of the Association: Of course I feel highly complimented by such an invitation, even if I am somewhat unprepared to comply with such a request. You may say I am one of the lights of other days; for, as I look about me and see the younger men who have grown up, I behold so few of the associates of earlier days. The four men in that picture were about the only gas men that were here then. I should feel I did wrong if I did not call attention to the picture of William C. Beggs, who built the San Francisco gas works in 1853, and who was in every way one of the most capable and able men who have been in the gas business. He came here, a young man from New Jersey, and built the works on this ground. He was succeeded by Mr. Sabbaton, from Albany, New York, and afterwards by his brother, Mr. James Beggs, and later by Mr. Jas. R. Smedberg. We also had in the employ of the Company another gentleman, Mr. Pierce, who died recently. He had gas works in Marysville and other places. In Stockton we had Mr. McKune, who built the gas works there. Mr. William C. Beggs and myself started the gas works in Oakland in 1866. This has been, as you have said, Mr. President, the commencement of the whole business on this Coast; but now it has grown so greatly and so far beyond the reach of any remarks of mine in illustration (and you all know so much more about it than I do), that I will not attempt to enlarge upon it. Very many changes have taken place in the business. First, came the introduction of oil and water gas, after having been derided and condemned by those best able to speak on the subject here and elsewhere, but you know it has become very general. The new features that have arisen since—the electric light and the Welsbach burner, for instance—which we have just been informed about, are all topics upon which I need not enlarge. At the time of the first lighting of this city (February, 1854), it occurred to me then, and I will repeat it now, that I thought that this Company should follow the scriptural injunction, to let your light so shine before men that they will see your good works; and I know of no better rule for gas men to follow. I thank you for the compliment given me.

(Considerable interest was manifested by all members present in the photograph referred to by Mr. Eastland in his remarks, which photograph was taken in San Francisco in 1864, exhibiting pictures of himself, Mr. Wm. C. Beggs, James Creigh and Norton Bush, the latter of whom afterwards became a celebrated artist. They represented respectively the first Secretary, Engineer, Book-keeper, and Collector of the San Francisco Gas Light Company, all of whom, with the exception of Mr. Eastland, have now passed to the other shore.)

The Association adjourned to Wednesday morning, July 17, at 10 o'clock.

Second Day.

The Association was called to order by Vice President Eichbaum, who called on Mr. C. M. Gregory to read his paper on the

TREATMENT OF OUR CUSTOMERS,

which he did as follows:

From the time when that exceedingly ingenious and variable form of almost limitless convenience, known as poetic license, was introduced into English literature, gas men have been privileged to regard all their customers as perfect ladies and gentlemen, and are becoming noted for treating them as such under the most trying circumstances. Let us be true to ourselves, and admit that this is as much the result of deep and careful study along the line of business policy as of inherent gentility. A rich gas at a reasonable figure must go to an abusive customer as well as to a polite one. We may as well complete the favor and supply him with an example of pleasantness and good nature that he cannot fail at first to admire and then to imitate. The profit on a daylight trade in gas for fuel is a clear gain, because we have to keep up the expense of running the whole works for the night trade, whether we have the day trade or not. In this matter the welfare of the customer should be considered in close conjunction with the welfare of the company. To gain this trade it is common custom to hire a professional canvasser with an oily tongue, a polished and refined ladies' man (if the solicitors present will pardon me for divulging the secret of their success), to sell the most improved and approved gas stove. This is to be commended, so far as it is honest; but should the price of gas be too high to compete with wood as fuel, what will be the result? Will the canvasser fail in his work? Oh, no! He will sell anything. If New England is the place of his birth, he will sell wooden nutmegs; but the high price of gas will cause many stoves to be shut off soon after they have been purchased, at a loss to both the consumer and the gas company, and those who have bought large stoves will proceed to give the gas company a deal of free advertising among their neighbors that we have no reason to be proud of. Is it not justice to the consumer to see to it before we sell a large gas range that the price of gas for fuel is not too high to be used economically on that range?

Is it not best for the company, as well as fair to its patrons, to keep a small profit on each of many stoves coming in during the hours that would otherwise be earning nothing? When gas fuel is cheaper than other fuel, the solicitor will not be compelled to solicit; he will have enough to do to fill out the orders as they come to him. While it is not profitable to the gas companies to keep the price of gas so high that all the solicitation and kind attention we have time to give will not keep the stoves in use, neither is it profitable to them to have the price so low that people can use gas in a reckless manner without instructions as to economical manipulation of burners.

Having drawn the line on that golden mean which permits the use of gas in every home with a watchful eye to economy, it then becomes the pleasing and useful duty of the gas man to warn his patrons not to let the gas idly burn while they call on the neighbors only a minute, "don't you know." If it is shut off before they go it will cost only a match to relight it when they return, an hour or so later, "don't you know," and they will have no cause to complain that gas costs too much for the value received. When the temperature in the water that is being heated rapidly has been raised to 212°, only one-half of the force of gas will be needed to keep it hot. Rooms warmed in the morning will remain warm with less gas than is generally used to keep them so, especially if the doors are not left wide open.

Thus, with innumerable kindly offered suggestions and genuine care, we can make our customers know that the individual members and employees of gas companies have souls and desire that patrons get full value for their money, and an endless amount of convenience and comfort from the gas they use.

The soft, smooth language of the sycophant is of no avail among business men. The treatment such customers need is a tonic for a declining purse. They remain our business friends as long as we continue to show an interest in saving money for them, and I know of no better medium through which to display that interest than the Welsbach incandescent gas lamp. All business firms pay out more or less for advertising their goods and consider it a good investment. We may calculate that the loss we sustain through displacing the naked flame with the Welsbach is the price we pay for advertising and introducing the Welsbach into hundreds of houses where we would otherwise have no consumption of gas.

When the gas company takes the trouble to inform its customers that the Welsbach lamp will produce one-fourth the heat and four times the illumination that would be given from an an ordinary lava tip using the same quantity of gas, they gain a host of supporters whose friendship is based upon coin, the most solid foundation for a business friendship that can be imagined. Is it not better that we present to our customers a rich light and a moderate bill and let them pay for service pipes when they want to use them, than to advertise free services and have a lot of them ordered at our expense where little or no gas will be used?

When the usefulness and brilliancy of our product causes the people gladly to pay for lamps and services for the privilege of using it, then will we realize that the last scientific advance in gas lighting is greater than the inventive genius of electricians has thus far been able to compete with, and leave them at the expense of planning improvements and experimenting for many years to come.

On motion, a vote of thanks was tendered Mr. Gregory for his paper.

Discussion.

Mr. Britton—I don't think we should let this paper pass without discussion. In my judgment it requires discussion to bring out the main points, both weak and strong, of an Association. On the treatment of our customers I think I am somewhat of a crank. I do not believe we can treat our customers any too well, and I also do not believe that we always treat them as well as we should. From 21 years' experience in the gas business I know that consumers look upon the employees of the companies as people to be abused and to be found fault with, and sometimes justly so. As a young man entering on the business, I made up my mind that, during the time that I remained in the business, I should never give any customer of mine the right to say that I was impertinent to him, or that anybody who might be under me was, and that I would give no one a chance to throw out suggestions of monopoly. During these years I have followed that idea, and when anyone enters my employ, his first instruction is that customers must be treated as though they were our best friends, and with the same affability that a grocer would treat his customers, and not to stand back because we have an article that the public must have. Most of us had to

wait for our enemy to light the lamp to show our feet the way to walk, in many respects. The electric lighting business has done more to stir up the gas men, and arouse them to the different methods, than anything else in all our experience; and we can look to them for a great many things. All of you who are interested in the electric lighting business know you give absolute attention to every detail of that business outside, so far as your customers are concerned. Your globes are cleaned every day and so are your incandescent lights, and even if the customer does not change them as often as he might, you give him the proper light that he pays for. You employ men to go around and do that. Before electric lighting became a business few gas men had sufficient forethought to go about among their customers doing what they should toward giving their customers a good light. We keep one or two men constantly on the go, looking up defective burners. We often receive complaints of defective globes, only to find on examination that the globes need cleaning. We give away a gross of burners and cleaners every month. Proper treatment of our customers is, after all, as Mr. Gregory said, the keynote to success.

Mr. Clark—I think we often fail to properly appreciate the importance of complaints. In larger works there is, of course, a man whose exclusive work is at the complaint desk. It seems to me it is at the complaint desk that we make our standing in the community, and that the best man connected with the gas company should meet the consumers who come there with complaints. We cannot get too good a man there. He must be affable, persuasive, courteous and long suffering, and at the same time he must have a high appreciation of the gas company's interests. All of these are qualities which you have to pay for. I have often seen boys at the complaint desk in the offices of gas companies. It seems to me that that is the most important desk in the office, at which you can make enemies or friends. When a customer comes to any of us and meets with indifference he becomes angry. He immediately jumps to the conclusion that the gas company's entire business is conducted on the same lines as at the complaint desk; and in that case I think he is justified in coming to that conclusion. Some of us are perhaps a little too quick in the use of the monkey-wrench. In all lines of business except the gas business they give credit. I do not think we should make it a rule to permit customers to run beyond the end of the month without paying their bill, but I do not think that when the third day is up we should send a man around with the monkey-wrench to cut off the gas. Of course different customers should be treated differently. I don't think we lose by extending courtesy and allowing a man to run a few days. The question of free services was raised by the paper. There are two sides to that question. A gas company builds its works and expends large sums of money in so doing, and when the point of service is reached and it leaves the main we inform the consumer that we have then put in all our money, and we can go no further. I regard the service, however, as a good investment. If we can get payment for our service, all right; but if not, I think we will be wise indeed to run the service.

Mr. Gregory—The case I alluded to in the paper was where the main ran along the street to other houses. If you go along and give it to every man who thinks he wants a service, and just as he thinks he wants it, he orders it because he wants it and knows he can get it, and when it is there 15 or 20 years it will be destroyed.

Mr. Clark—We would not lay a main on a street because some residents say to us that some time they will need the main. I would not lay a service in a man's house because he said "I would like to have the service in my house;" but when he comes to get the gas I would lay the service in order to get him as a consumer.

Mr. Clements—I quite agree with Mr. Clark on the proposition of laying services, but of course not on speculation. You can frequently secure a customer by laying your service to his house, when, if he had to pay for it he would not be a consumer. The electric light companies run their wires on their poles in front of a house, and although they do not run into each and every house on the line, we put wires in a house and put the current there, and when the dynamo starts in we give him the light and charge him nothing for that. If the electric light people do that, making no charge for it, and a customer should say "I would rather have gas, as I am not exactly satisfied with the electric light," and the gas company should say, "We will charge you for the service," the gas people must meet the electric light people on that proposition, the same as on some other.

Mr. Osborne—That is exactly the proposition. The electric light people bring the current to your door, and before bringing it to you tell you what it will cost for a light. If the gas people say they cannot tell you on the start what your gas bill will be, but that you will have to pay for your service besides, although they will put in all the appliances, they will lose a customer. To whom does the service belong after it is put in? It belongs to the gas company after the consumer pays for it, I believe. On my gas bills I believe it says that we shall have charge of everything and shall have free access to the meter. A customer of ours once wanted to take the service out. I told him it could not be removed unless I was present to see to it. I removed it, of course, because it was in his way where it was. He thought he had full control over it, however. In these days of electric lighting and other competition, the gas company that charges for a service will get left. At "our house" I am perfectly willing to put in all the services desired gratis, and put on an extension, if they will only keep me even.

Mr. H. E. Adams, of Stockton, Cal., announced that he had been unable to complete his proposed paper on

PRODUCER GAS,

but that he could give the salient points thereof. He stated that the process as now used by his Company is a down draught furnace, no use being made of the producer gas. Mr. Adams further stated that the Loomis gas process, transformed into a plant for manufacturing carbureted water gas, was advantageous as an auxiliary to a coal gas plant, after the abandonment by his Company of its intention to manufacture a fuel gas that could be used with a Welsbach burner, in opposition to the natural gas served at Stockton by a number of companies. That the best results had been attained by the use of English patent coke, in place of either bituminous or anthracite coal.

Discussion.

Mr. Clark—This is a matter that interests me exceedingly. I do not desire to unduly take up the time of the Association in the discussion, but if I may ask a question or two now I will promise to remain quiet hereafter. Mr. Adams referred to explosions taking place when producer gas was carried to a distance across the street. I do not understand that. I see no danger of explosion in the conduit. I would like to ask what he does with the producer gas, and wherein the advantage of the Loomis generator lies over any simple cylinder, and where is the advantage in using coke instead of coal?

Mr. Adams—We are not using producer gas now. We were informed it was liable to cause an explosion if used under our electric light boilers, located on the opposite side of the street from the gas works. As regards using hard coke, we experimented on Ione coal and both anthracite and bituminous. We found, however, that by using English coke we used less of it, and the cost was materially decreased.

The Vice-President—This being a type of apparatus used in but one place in four States, California, Nevada, Washington or Oregon, it is not of as much interest to us.

Mr. E. C. Jones then read extracts from a paper on

CALCIC CARBIDE,

and gave an exhibit of acetylene gas produced from the carbide, following the same with these remarks:

Producing the cyanides from acetylene gas gives us another means of obtaining certain colors, and in fact the field will be so great that the effect will be almost revolutionary upon chemistry.

A pound of the material of calcic carbide is only a little better than a half pound of steam coal. That would seem to settle the question of carrying this substance on a steamer or on a locomotive, with a simple contrivance for dropping the water on the substance and converting it into acetylene gas, and using that gas for driving the machinery or doing any kind of work. Theoretically it would be better to carry coal. You understand that in converting the calcic carbide into acetylene gas and using the gas, we can develop and get more of the energy of the gas in work than we can by any known means from coal. Still the facts exist, as I state.

I have a few further notes on calcic carbide which may be of interest. They are disarranged notes that I have taken from data picked from time to time, but I will read them.

The weight of acetylene gas is 69.48 pounds per 1,000. The specific gravity of calcic carbide is 2.22.

As you probably know, acetylene gas is also produced by the incomplete combustion of coal gas in a Bunsen burner.

When any Bunsen burner has lighted back, the odor is due almost wholly to the manufacture of acetylene gas thrown out into the atmosphere, and acetylene gas possesses poisonous properties similar to carbonic oxide. It has more of poisonous effect than other diluent gases, such as marsh gas and carbonic acid and oxygen and nitrogen. These latter gases do not have the effect on the red corpuscles of the blood—stealing away the oxygen of the blood—that acetylene gas does. I think

it would be much more poisonous than coal gas; that is, used as a separate gas, unmingled with other gases.

In the combustion of this gas, 1 volume requires 2½ volumes of oxygen.

Mr. President and gentlemen, I thank you kindly for your attention, and if there are any questions I can answer I will be pleased to do so.

Discussion.

On motion of Mr. Eichbaum, the thanks of the Association were tendered Mr. Jones for his interesting paper and experiment.

Mr. Parker—Has this gas ever been tried in gas engines in the way of exploding in the cylinder?

Mr. Jones—I think not. I think the substance is so new and in its infancy, and it exists in such small quantities, so widely scattered among scientific men of the country, that it is doubtful. There have been experiments made to carburet the fuel water gas, but they have not yet been successful. Prof. Lewes is carrying on experiments on the illuminating value of acetylene gas in various mixtures, such as coal gas, water gas, etc. He is getting discouraging results, however; he has run against phenomena which are hard to be explained and which cannot be explained to-day. I believe the last number of the American Gas Light Journal had a most interesting article by Prof. Lewes.[1]

Mr. Lowe—How would this compare with our ordinary fuel, if used in a gas stove?

Mr. Jones—It would be about double the value of ordinary carbureted water gas.

Mr. Lowe—Then this new gas is about twice as good as the ordinary gas?

Mr. Jones—Yes, sir. I find you can develop more of the energy.

Mr. Lowe—I have found the same thing in the use of our uncarbureted water gas.

The President—The efficiency of those non-luminous gases for power purposes is not due so much to the action of the heat as to the chemical action which takes place between the combustion of oxygen and hydrogen, which makes one of the most intense flames. It seems to me the chemical action would be most intense. Do you not think it results from the combustion of hydrogen, rather than carbon and hydrocarbons in the gas?

Mr. Jones—It may be due to the molecular construction of the gas.

Mr. Lowe—Do you think that acetylene gas used in gas engines would be as effective as our ordinary commercial gas, to-day?

Mr. Jones—No; I think it would not be.

Mr. Eichbaum—We have heard the theoretical part of the question; now for the practical part. Supposing acetylene gas could be obtained at a reasonable price, what would be its value as compared with Australian shale, which we know is about 14,000 cubic feet of 40-candle power to the ton? As compared with Australian shale, have you made any calculation as to its value?

Mr. Jones—No, sir; I made no comparison with Australian shale, and I am sorry that I have not. It would be most interesting. The Australian shale is a most marvellous coal. None of it is brought here at the present time, and oil has almost entirely superseded it. I made comparisons with the petroleum which we are using in our works.

Mr. Clark—It appears to me that in the use of acetylene the question is of great interest to us. First, can acetylene be used for enriching gas? I know that it can, from my own work. Second, can it be produced at a cost that will permit us to use it as an enricher? I do not believe it has ever been produced in commercial quantities. Can it be produced cheaply enough for an enricher; and, if so, can any company control it? The company I am with has spent much time on this subject. We have taken the matter up, not because we are at all frightened, but in order to ascertain whether it would be profitable for us to engage in the manufacture of calcic carbide. I do not now believe that the manufacture can be controlled by anybody. When you sift Mr. Willson's patents down, it is a certain form of furnace, and that is all. Mr. Willson does not claim the manufacture of calcic carbide, or the manufacture of calcic carbide from lime and carbon, or the manufacture of calcic carbide in an electric furnace, but certain improvements in an electric furnace that he made and may not be able to maintain the ownership in. That is all he can claim. I look for the time when the calcic carbide will be produced in sufficient quantities to enable us to use it in the gas business as an enricher. It cannot be produced cheaply for consumption up to the present time. I have attended the lectures of Mr. Willson several times, and have been in New York and have heard what he has to say. They make a very careful adjustment and comment on it when they compare it with city gas; but he speaks of city gas in a very reckless and extravagant way. After hearing the lectures and the lecturers, I think the gas companies need not be apprehensive. The question of the cost of calcic carbide is perhaps the most important. The men in control have said to me that they could make it for $3 a ton. They say it could be made so cheap that the question of first cost is nothing. If calcic carbide is $3 per ton that is, of course nothing. The gas companies could very well afford to pay very much more than $3 per ton. I have heard Mr. Willson claim in his lectures that it would be made for $5 a ton, and that it had been made for $12. I think he was mistaken in both statements. A very large electrical company using water power have made statements that it cost them over $200 a ton. I have seen that statement in writing. That may be an error. It might be that it has cost them $200 a ton, but that it could be produced very much cheaper. I have hopes that in time we will be able to get it for $50 a ton, but it will only be after very considerable improvements are made in electric furnaces.

Mr. Jones—I hardly think calcic carbide could be produced at $3 a ton. If you had free water power running between bluffs of limestone, and free coal from your mine, it would necessitate the burning of the lime in a lime kiln and the application of electric power, and I doubt if $3 would cover the running expenses, to say nothing of the cost of material. I saw an account in the patent reports where a man claims you may liquefy acetylene gas by its own pressure. He evolves gas in a little machine, and the pressure accumulated in the machine by the production of the gas will liquefy the gas itself by the use of his apparatus, which he describes. I believe the American Gas Light Journal had a description[1] of it. Another thing. If I remember rightly it was said that the alternating current could not be used for the production of calcic carbide; that only the direct current would do. Mr. Willson says, however, that they are using the alternating current now with better results.

Mr. Clark—I have heard Mr. Willson claim that one electrical horse power will produce about three tons of calcic carbide per year. That is a claim that I am not at all prepared to admit or to maintain. If he could produce three tons with one electrical horse power a year, of course the price of $3 is absurd. The electrical horse power cannot be bought at $9 per annum in this country. That price does not include cost of materials or transportation. The carbide would have to be shipped in air-tight vessels, of course. Another point is the purity of the material. The samples we have analyzed gave less than 50 per cent. pure. I have seen better calcic carbide than that, but I have seen very little of it. When they talk of its producing over 10,000 feet per ton they mean with perfectly pure carbide, of course, and not an article of commerce. One of the claims of the qualities of the calcic carbide is that the lime will be shipped back again. If you get 200 or 300 or 400 miles away, of course you cannot ship it back again. We have manufactured it on a small scale for experimental purposes, and not at all for the purpose of determining the cost, and there are difficulties in connection with its manufacture that I see no way out of at present.

Mr. Lowe—About how much lime would a ton of calcic carbide produce?

Mr. Clark—I think about 1,200 or 1,400 pounds. I do not know.

Mr. Lowe—Is it not possible to buy a ton of the carbide in the market here to-day?

Mr. Clark—I guess not. A firm advertised the carbide for sale, but their stock was very soon exhausted.

Mr. Lowe—I do not think it possible to get it. I desired to get a small quantity for experimental purposes, and if it was possible to get a small quantity of it, it could not possibly be landed in California for less than $150 per ton.

Mr. Clark—Where oils are high it might be used. That would not be the case in California. It is not a matter of immediate interest to gas men. If nobody can control the manufacture of calcic carbide, it ceases to be a matter of immediate importance. We are simply waiting until somebody develops the fact that it can be made cheaply. We cannot develop that fact. It will have to be done by an electrical company with a very large power, and engaged in the manufacture of something else, because it will be only as a bye-product, I think, that it can be cheaply produced; that is, without some new discovery in the electrical furnace. It is a rash man that says that any given thing is impossible, and it is possible that calcic carbide will be so cheap that we can use it for the enrichment of blue gas. But I do not believe it.

Reports of Committees.

The report of the Committee on Obituaries was here read.

1. See *ante*, p. 42.

1. *Ante*, p. 40.

In Memoriam.

Van Leer Eastland died September 8, 1894, after 27 years of active service in the field of gas industries, and more than 40 years after his first engagement in the works of the San Francisco Gas Light Company.

His was a character worthy of emulation by all who survive him. Zealous in every just cause, honored because honesty was his creed, loyal to all his trusts, kindly in all his ways, esteemed by those with whom he came in daily contact, and respected because of his manliness, it becomes this body, of which he was an earnest member, to halt in its progress and say of him, as was said of that noble Roman, "His life was gentleness, and the elements in him were so mixed that Nature might stand up and say to all the world, 'This was a man!'"

Whereas, The Reaper, Death, has invaded our Association and removed from among us our associate, M. G. Elmore, it becomes us, as members of the Pacific Coast Gas Association, to have spread upon our minutes a recognition of this lamentable yet inevitable fact; to convey to his family our sympathies in this their most severe affliction, and extend to them all that human words can express, our sorrow.

J. A. Britton,
E. C. Jones,
T. R. Parker,
} Committee.

On motion of Mr. Eichbaum the report was spread in full upon the minutes, and engrossed copies were directed to be sent to the relatives of the deceased members by the Secretary.

Report of Committee on Next Place of Meeting.

The report of the Committee on Next Place of Meeting was here read. The Committee recommended San Francisco, and the report was unanimously adopted.

Report of Committee on Nominations.

The report of the Committee on Nominations was here read, as follows:

For President—E. C. Jones.
For Vice-President—F. H. Eichbaum.
For Secretary and Treasurer—John A. Britton.
For Directors—G. W. Wilson, C. O. G. Miller, B. U. Steinmann, O. M. Gregory and S. B. Cushing.

Election of Officers.

On motion of Mr. Clements the report of the Committee was accepted, and the Secretary was instructed to cast the ballot of the Association for the gentlemen named therein. The Secretary then cast the ballot in accordance therewith, and the President then announced those officers elected for the ensuing year.

Responses.

The President—In retiring, I wish to say briefly that there is no one in our organization superior to the President whom you have just elected. Probably there may be others who are equal, but there is certainly no one superior to the gentleman whom you have named as President to conduct the affairs of this Association for the ensuing year. It affords me pleasure to introduce Mr. Jones, our President-elect.

Mr. Jones—Gentlemen of the Association: I appreciate very highly the honor you have done me this day. I know of no position in any other Gas Association in the United States that I would esteem so highly as that of President of the Pacific Coast Gas Association. I will not say that I did not want it. It was my ambition, but not at this time. I was in no hurry; but at any future time I would have been gratified to be so highly honored. I desire to ask you, gentlemen, to each and all kindly assist me during the coming year, as you have so ably assisted my predecessors, Messrs. Crockett and Quilty, and we will endeavor to make our next annual meeting as successful as the three meetings we have already had. That, I think, is all we can ask, and I again thank you very kindly for the honor which you have conferred upon me.

Mr. Quilty—In retiring, I wish to say that the working members came into the breach at the last moment to make up for some of the derelictions of the President. I must confess that I have not given the organization the amount of attention and work that I should have during the past year. I was not really worthy of filling the place, because of a want of effort. I neglected my duties and allowed the burden of the whole work of this successful meeting to rest upon others.

(Mr. Jones, the President-elect, here took the chair.)

Mr. Eichbaum—Mr. President, it came to my knowledge yesterday, in a roundabout way, that Mr. Parker had been to considerable expense in relation to preparing exhibits and curiosities for the banquet of this Association, for all of which he has rendered no bill. I think Mr. Parker is so modest he would not do it, and I therefore move that any expense that Mr. Parker or anybody else has incurred on behalf of this Association be presented in the shape of a bill, submitted to the Auditing Committee, with the recommendation that they be settled.

(The motion of Mr. Eichbaum was seconded by Mr. Osborne, and carried.)

Report of Committee on President's Address.

The report of the Committee to consider the President's Address was here presented by Mr. Jones, the Chairman, recommending that a vote of thanks be tendered President Quilty for the masterly way in which he had handled the problems which present themselves for a gas man's solution, and that an Executive Committee of three be elected as a Research Committee, who, it is expected, will keep informed concerning the status of the gas business and the invention and introduction of new appliances, and that they shall report at the next annual meeting, and should urgent need require it, they may communicate with the members through the Secretary of the Association, who may call a special meeting of the Association, as required by the by-laws.

Mr. Osborne then moved the adoption of the report, and that said Executive Committee of three shall consist of the President, Vice-President and Secretary; which motion was duly seconded and unanimously carried.

Mr. Eichbaum—Some man has discovered the great problem of the light of the glow worm—that is, light without heat—and I would like to know if any gentleman present knows anything about it. If so, I should like to hear from him. It would be the culmination of everything that has ever been dreamed of by anybody of lighting by any process whatever.

Mr. Lowe—Something has been done in that line by Tesla, in the electric field, but it is, however, the remotest sort of an experiment, little known to even himself. I do not think any of us will ever see it a successful commercial affair.

THE QUESTION BOX.

Secretary Britton—One of our hardest tasks during the year was to get members to send in questions. The Eastern associations seem to have no difficulty in this respect, but here the members appear loath to ask questions, not that they know it all, but because they do not like to. I think during the coming year if something comes up that a member cannot solve he should write it down and study it, then if it solves itself all the better, but if it does not he should bring it in here at the next session for the purpose of allowing us to think it over with him. Question No. 1 is:

"Have the members noticed that the black pipe has been so poorly welded during the past year as to render it unfit for service. If so, what can be done about it?"

Mr. Quilty—We test all service at San Jose with steam pressure before tarring it and putting it in the ground.

Mr. Britton—We follow the same method in Oakland. We make a steam connection with the pipe and then coat with tar, and have found defects that never occurred to us before. It is not imperfect welding so much as it seems to be pitting. The trouble apparently looked to be traceable to electrolysis, for the pitting was in the nature of pinholing.

Mr. Gregory—Is that new pipe that you speak of?

Mr. Britton—Yes, in some new pipe that we bought.

Mr. Gregory—Perhaps the members are purchasing new pipe made of steel, which they find they cannot weld so easily. We find the iron pipe better, and it holds better.

Question No. 2.—"If, by drawing a little air through the standpipes, or admitting it at the exhauster, when the quantity and quality of coal are the same, we find the purifiers remain clean twice as long without changing, what becomes of the impurities which, without the admission of air, would long since have soiled the purifying boxes?"

Mr. Clark—I have known the life of boxes to be lengthened from 12 to 20 times by the addition of a small amount of oxygen. Doubtless many of you have observed that but for the admission of a little oxygen it might be necessary to open the purifiers every month. The method is very general to admit a little oxygen with the gas, but it is unsafe to admit it at the standpipe. The proper way of admitting it is to connect a small pipe with the exhauster, so that each revolution will admit a certain amount of air. If you draw it in by the standpipe the less gas and more oxygen you are liable to get. It is cheaper to make up for the effect of the oxygen by the addition of a very small quantity of enricher. I have tried several times, but have not yet been able to determine the difference between the gas flame in which the oxygen was

present and the flame in which it was not present; the amount of nitrogen being four-fifths of 1 per cent., which would accompany one-fifth of 1 per cent. of oxygen. That amount of oxygen will govern the amount of the purifying material very greatly. In very large works I have known oxygen to be put in with a small blower. The per cent. of oxygen varies from one-fifth of 1 per cent., which would amount to 1 per cent. of air, and that is ordinarily sufficient.

Mr. Parker—I understand the question to be, What becomes of the impurities in case air is admitted?

Mr. Clark—The sulphureted hydrogen having formed a sulphate of iron in the box, the oxygen comes in contact with this sulphate of iron, the sulphate being thrown down as a solid, and exists as sulphur in the box, doing no more harm than so much sand. Its presence should not destroy the value of the oxide. When the amount of the sulphur in the oxide rises to perhaps 40 per cent., the oxide becomes so heavy and dense it should no longer be used. In some cases, I imagine, it is in the iron; but the impurity then remains in the box as solid sulphur.

Mr. Britton—Where a steam jet exhauster is used, what plan would you suggest of drawing in the air?

Mr. Clark—There is then only one plan that is thoroughly satisfactoby (possibly it is not so), which is to control the action of the air pump by the revolutions of the station meter. The point is to introduce a certain proportion of oxygen, as the make of gas varies from day to day. You should know that for every 1,000 feet of gas you have, say, 2 feet of oxygen. If you introduce oxygen by any method that is not controlled by the flow of gas, you may get more oxygen or less than you want. You may extend the shaft of the station meter and connect it with the air pump, so that for each revolution of the station meter, which will mean a certain amount of gas, you can introduce the amount of oxygen you desire. By providing for shortening the stroke of the air pump, you provide a means for changing the proportion of the oxygen at will. I do not like the idea of connecting the station meter in that way. If you do not do that, and if you have no rotary exhauster, you had better perhaps not attempt to revivify that way. In case you do, however, you must watch the pump very carefully while putting in the oxygen. The man must have it constantly under control.

Mr. Eichbaum—Could it not be done by using an aspirator and connecting to the meter? Of course that would enable you to regulate the supply of air, even with a steam jet.

Mr. Clark—That is not safe, in my judgment. I tried it once or twice and it was not satisfactory. It has to be left to somebody to see that the right proportion of gas is going in all the time. As there is a time when very little gas is being made, you have to depend on the man at the bench to turn off the aspirator that he is using, and you cannot depend upon him to do it. One works where I was called in had an arrangement of that kind, but I did not know it; and they were having the utmost eccentricity in their results. The gas would be low at one time and not at another. It was all owing to that method, which, being changed so that a certain proportion of gas was being introduced at one time, their troubles at once vanished.

Question No. 3.—"What is the best method of cleaning a naphthaline stoppage in a house or lamp service?"

Mr. Jones—I placed that question in the box on account of having learned something of naphthaline stoppages from an Eastern visitor, and I found its value. When Mr. Brown, of Minneapolis, was here he informed me that he was using crude petroleum to free his stoppages with, and he finds that he has no repetition of the trouble.

Question No. 4.—"Does it pay to re-line furnaces while running?"

Mr. Jones—Probably that question is asked with the supposition that limited numbers of benches are in use, and the purport of the question is to determine whether a furnace can be re-lined a little at a time.

Mr. Osborne—I am responsible for that question. I have a bench that will have been running four years next October, and I think the retorts are good enough to last another winter; but the furnace is in a bad state and takes too much coke. I would like to know how to reline this furnace, what to do with it, and if it will stand. I have to make gas every day, and I desire to repair the firebox, but not the sides of the furnace.

Mr. Gregory—The best material I have used in that kind of work was purimachos.

Mr. Clement—By putting on a little each day, I find it will come out as you desire. I have used as much of it as 4 inches thick, where the wall was broken off by knocking off the clinkers. If your retorts and benches are apparently good enough to last another year, I advise you to try it.

Question No. 5.—"Is any gas company on the Coast now using Japanese coal, and using it successfully? If so, what is the result of it in small works?"

Mr. Eichbaum—We find we can use 25 per cent. of it with very great success. A remarkable phenomenon connected with Japanese coal is that the materials vary very much indeed. About two years ago we purchased about 2,000 tons of it, and have some still on hand. The other day we received another lot. Although the coal looks alike, and you could not by looking at it possibly tell it apart, some of it contains so much sulphur that it cannot be used at all. In fact, you might just as well have sulphur at once, for you can only use it as steam coal. Not another pound of it will go into our retorts. If anybody here is dealing in Japanese coal, I am sorry to give it a black eye; but I will be still more sorry if any gas man should get into trouble through using it. The utmost care and vigilance in buying it are insufficient, in my judgment, to prevent a man from obtaining a coal only to find it useless after he has purchased it. It took up for purification as much oxide in three weeks as should have been used in six months, compelling us to work almost night and day for six weeks making new material. There are probably one or two seams of it that look exactly alike, one of which contains very much more sulphur than the other. The first lot of it that we had worked reasonably well, it not having sufficient sulphur to seriously inconvenience us, and we worked it quite successfully. If there is danger of getting coal that contains four or five times as much sulphur as the coal should possess, it is too difficult to work. The behavior of this peculiar quality of coal, coming from the same place, and apparently the same, explains to me the statements that were made by members at the last meeting, who had tried Japanese coal, that they had so much trouble with it that they could not use it. I had then been using that coal right along, and up to that time had had no trouble whatever with it. I now attribute it to the different qualities of apparently the same coal.

Two Communications.

The following communication in respect to the publication of the proceedings was then read by the Secretary:

San Francisco, Cal., July 15, 1895.

John A. Britton, Esq., Secretary Pacific Coast Gas Association—My Dear Sir: As it is of acknowledged value and advantage for an Association such as the Pacific Coast Gas Association to have an official organ for the publication of proceedings and the general dissemination of notices and information, and as the American Gas Light Journal is already the "official organ" of the American Gas Light Association, the New England Association of Gas Engineers, the Western Gas Association, the Society of Gas Lighting, and the Guild of Gas Managers, and as the said Journal is the only weekly publication in this country devoted to gas, therefore, I hereby make the following proposition:

If the Pacific Coast Gas Association names the American Gas Light Journal its "official organ," the Journal will bear the expense of taking the annual reports of the Association, publish the same, supply each member of the Association with a copy of such proceedings, and, when requested by the Association's Secretary, will supply a copy of said proceedings, before they have appeared in print in said Journal, to any other publications by him designated, for the nominal cost of making such copy. Very truly yours, Elbert P. Callender.

On motion of Mr. Eichbaum, duly seconded, it was unanimously voted that the offer of the American Gas Light Journal be accepted, and said Journal be made the official organ of the Association.

A second communication on the subject of the relative values of anthracite for gas purposes was then read.

San Francisco, July 17, 1895.

To the Pacific Coast Gas Association—Gentlemen: Permit me to call your attention to the question of relative values of anthracite coal for gas purposes.

I take the liberty to suggest that it would be well for your Association to authorize a test, to be made at some centrally located plant convenient to ship and car, of about 40,000 lbs. each of Welsh anthracite, Pennsylvania anthracite and Colorado anthracite, to determine the relative differences, after taking into account the labor of screening the Welsh and the loss on screenings, the latter being worth just as much as the cheapest steam fuel will cost for boiler use.

Calling the average percentage of screenings in a cargo of Welsh anthracite 40 per cent., would mean 33⅓ tons of Welsh to yield 20 short tons of clean Welsh, as against 20 tons each of Pennsylvania and Colorado. The Colorado can be landed at the works at San Francisco or Oakland at $10.75 per ton of 2,000 lbs., and the Pennsylvania at $11.50 per ton of 2,240 lbs., for the purpose of the test. This data should be of

great value to all water gas plants, for the reason that Colorado has a present enormous output, and can land coal here daily as wanted in any quantities; and in the event of prices materially advancing, you would be in a position to know the exact values.

For the quality and satisfaction given by the Colorado coal, I will refer you without permission to Mr. Britton, to whom I sold 200 tons of the large egg (see circular for sizes.) I also sold about 8,000 tons to the California Sugar Refinery.

While I do not anticipate any business on Colorado coal at present, I believe you should thoroughly inform yourselves on a product that you may at some time be glad to avail yourselves of.

I have no doubt, if encouraged, prices of Colorado may be materially reduced. Yours respectfully, CHARLES R. ALLEN.

On motion, the communication from Mr. Allen was referred to the Executive Committee.

The Secretary then read communications from Messrs. Kempf, of Salt Lake City, Utah; B. U. Steinmann, of Sacramento; Chas. B. Hurley, of Tacoma, Wash.; and A. W. Littleton, of the Quincy (Ills.) Gas Light and Coke Company, expressing their regrets at being unable to attend the meeting of the Association, with best wishes, etc.

VOTES OF THANKS.

Mr. Britton—I think it due to certain people who have assisted in making this meeting a success, that they should receive a vote of thanks. I therefore move a vote of thanks to the Union Iron Works, for the kindly loan of their steamer "Rockaway" for the excursion to-day; also to Commodore Caduc for the use of the grounds and house of the Pacific Yacht Club, for the lunch; and also to the San Francisco Gas Light Company, for their efforts in making this meeting a success; for the use of their room, and in going to all the trouble that they have been to for the purpose of making the meeting successful.

Said motion was duly seconded and unanimously carried.

Mr. Parker then moved a vote of thanks be tendered the retiring officers for their efficiency during the past year. The motion having been seconded, the President-elect (Mr. Jones) said—Gentlemen: It is with great pleasure that I put this motion. Mr. Quilty has performed the duties of presiding officer in an admirable manner, and he certainly deserves the thanks of this Association. The other officers have done their work well, as the results of this meeting show, and this motion will be put to a rising vote.

The motion was carried unanimously.

On motion, the Association adjourned.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

IT is with regret that we record the death, on July 23d, of Mr. John M. Hansen, a bright young gas engineer, on the staff of the United Gas Improvement Company. Deceased was born in Denmark, February 22d, 1870, and came to America in 1887. He graduated from the Stevens Institute of Technology, Hoboken, N. J., in 1891, and since his graduation had been employed by the Company named above. His work was in its construction department, taking charge of the erection of apparatus; but he was also especially capable in all matters connected with gas chemistry and gas analysis. His death was occasioned by consumption of the lungs. We are indebted to Mr. Wm. J. Serrill, Executive Clerk of the U. G. I. Company, for the facts recited in this connection.

THE Danville (Ky.) Gas Company has contracted with the Kerr Murray Manufacturing Company, of Fort Wayne, Ind., for extensive improvements on its works. This means, of course, that the Company will not install a water gas apparatus as was its purpose a year or so ago. President Cheek is well satisfied at the outlook for increasing trade at Danville, where gas for cooking has made its way rapidly to favor.

THE death of Mr. Simon Schiele, President of the Frankfurt Gas Company, of Frankfurt-on-the-Main, Germany, occurred on the 15th of July. Mr. Schiele was greatly esteemed.

THE regular semi-annual dividend of $3 per share (6 per cent.) has been declared by the Wilmington (Del.) Coal Gas Company, payable on demand. A further change in the financial condition of the Company is shown in the following circular, issued to the stockholders by the President on the 1st inst.:

"Anticipating a continuance of the steady growth of our city and the increase of our business therefrom, and knowing the necessity of keeping our works abreast of the times by adopting the latest and best improvements in gas making and extending our pipes in advance of the improvements of the city, the Directors have this day authorized an increase of the capital stock of the Company from $500,000, the present capital, to $550,000, by the issuing of 1,000 shares of new stock, at par ($50 per share), pro rata. to stockholders, as registered this day. You are, therefore, entitled to subscribe for one share of this new stock for every 10 shares of stock held by you August 1st, 1895, subject to the following conditions:

"1st. Shareholders must notify the Company of their acceptance of this privilege and pay one-half of the amount required on or before the 25th day of October next, for which payment scrip, signed by the President and Treasurer, will be issued, subject to a further payment of $25 per share on or before the 15th day of February next, after which payment stock certificates will be issued on the surrender of the scrip.

"2d. No interest will be allowed on any payments, nor will the new stock be entitled to any dividends before August, 1896.

"3d. While advanced payments may be accepted to accommodate subscribers, in no case can the new certificates be issued before February 15th, 1896.

"4th. Failure on the part of any stockholder to accept this offer on or before October 25th, 1895, will forfeit the privilege herein granted.

"5th. Shareholders not wishing to subscribe, or those holding less than 10 shares, or any having shares in addition to those they subscribe upon, may assign their privileges to others on blanks furnished by the Company on application, such privileges being convertible into stock as other privileges are, when presented in sums of $50 or multiples thereof."

THE Taylor Iron and Steel Company, of High Bridge, N. J., has recently installed the C. W. Hunt Company system of cars and track for handling its material. The Otis Company, of Ware, Mass., has also made additions to its already very complete system of Hunt industrial railways.

THE Peoria (Ills.) opposition gas franchise recently granted by the authorities of that city to J. Frank Aldrich has not yet been officially accepted by him. The "days of grace" respecting his final action terminate on the 25th inst.

MR. LUCIEN B. CLOUGH, a Director in the Peoples Gas Light Company, of Manchester, N. H., died at his home in that city, on July 28th. Deceased was born in Northfield, N. H., in 1823, and graduated from Dartmouth College in 1850. He removed to New York State to complete his education in the law, and was admitted to the bar at Albany, N. Y., in 1853. He was judge of probate in Manchester in 1874 and 1875, and held many positions of trust in that city. He was a trustee of the City Library, a Director in the Amoskeag National and Savings Bank, and of the local Board of Underwriters. His wife, whom he married in 1859, was a Miss Marion Dole, of Augusta, Me.

THE special committee appointed by the Bar Association, of Monmouth county, N. J., to draft a memorial respecting the late Charles A. Bennett, Jr., Manager of the Freehold Gas Light Company, reported the following:

"The Bar of Monmouth county, through its committee, appointed by His Honor, Judge Conover, place upon record this tribute to Charles A. Bennett, Jr.:

"Mr. Bennett was among the younger members of the Bar of this county. He was admitted to practice as an attorney in 1878, and as a counsellor in 1881. During this time he had won, by his frank disposition, sterling integrity and firmness of character a host of friends and admirers. His active and earnest nature and his high belief in the honor and dignity of the Bar were strongly pronounced. His devotion to the local enterprises with which he was identified and the responsibilities of his official positions have, in a great measure, prevented his active practice at the Bar, but through his energy and counsel, strong fidelity, untiring attention, research and study, these institutions have increased in strength and efficiency.

"As a citizen, every substantial public improvement had in him a warm advocate. To him, in a large measure, are due many facilities and modern conveniences which increase the comfort and happiness of the residents of our town. By his keen eye and quick perception he grasped and utilized new ideas which were of worth and value to this community, as well as to those he so faithfully served.

"As a friend he was candid and open in all things, ever ready to give and receive advice, and especially beloved by those with whom he had formed a close attachment. Those feelings of friendship endured from the days of his boyhood through life, and to-day many true friends mourn his untimely death.

"To the family who have lost one who was their comfort and stay, and whose presence was their delight and pleasure, we extend our deep and heartfelt sympathy."

THE Cleveland (Ohio) *Leader* says that on August 3d the Cleveland Gas Light and Coke Company paid into the city treasury the sum of $21,053.97, which sum was due the city under the agreement by which the Gas Company pays to the city 6½ per cent. of its proceeds in semi-annual payments. The Peoples Gas Company, on the 5th inst., paid $4,753.86 into the treasury on the same account for the first half of the year. The total thus received on this account for the first six months of 1895 amounts to $25,807.83. The moneys received by the city from the Gas Companies since the ordinance became operative amount to $137,603.44.

ON October 1st next the Beverly (Mass.) Gas Light Company will reduce its selling rate to $2.20 per 1,000 cubic feet, with a discount of 30 cents per 1,000 cubic feet for prompt payment.

AT the annual meeting of the Southbridge (Mass.) Gas and Electric Company the officers chosen were: Directors, G. W. Wells, C. A. Dresser, C. D. Paige, H. C. Cady, J. M. Cochran, J. D. Blanchard and H. C. Wells; President, H. C. Wells; Treasurer, George W. Corey; Clerk, Albert B. Wells.

MR. F. G. DEGMEYER, whose connection with the Erie (Pa.) Gas Company dates back to 1855, tendered his resignation on the 1st inst. Failing health is the cause of his retirement.

WE understand that a gas works is to be constructed at Bennington, Vt. This place is a post village of Bennington township, and is on the Bennington and Rutland Railroad, at a point 55 miles south by west of Rutland, and 35 miles northeast of Albany, N.Y. It has iron foundries, knitting mills, woolen factories, potteries and woodworking establishments, and is a place likely to grow in importance. The population of the village is about 4,200, but adjoining it are the villages of North Bennington and Bennington Center, the combined population of the three places being little short of 7,000.

AT the annual meeting of the Lowell (Mass.) Gas Light Company the officers elected were: Directors, Sewall G. Mack, Levi Sprague, Jacob Rogers, Alexander G. Cumnock, George S. Motley, Edward M. Tucke and James Francis; Treasurer, Jacob Rogers; Clerk, D. Bradford Bartlett.

AT the annual meeting of the Fall River (Mass.) Gas Works Company the showing for the year was an excellent one, and a dividend of 10 per cent. for the year was formally declared. The officers elected were: Directors, John S. Brayton, Oliver S. Hawes, George P. Brown, Samuel T. Bodine, Randall Morgan, Henry Lewis, David Paton; President, John S. Brayton; Clerk and Manager, George P. Brown; Treasurer, Edward C. Lee.

THE Lexington (Mass.) Gas Light Company has recently issued $30,000 first mortgage bonds, the proceeds to be devoted to the construction of an electric lighting annex. Mr. Allen Arnold has been added to the Board of Directors.

"OBSERVER" forwards the following under date of the 3d inst.: "At the annual meeting of the Woburn (Mass.) Gas Light Company the following were chosen a Board of Directors: John Johnson, Benjamin Hinckley, R. J. Monks, Charles A. Jones and Oliver F. Bryant. Mr. R. J. Monks was elected Treasurer and Clerk, and the Directors organized by electing Benjamin Hinckley, President. It was voted to replace the 4-inch pipe in Main street, from the Common to Hammond square, with a new 6-inch pipe. Originally the size of the Main street main was as follows: From the works to Green street, 8-inch; from Green street to Common, 6-inch; from Common to Hammond square, 4-inch. Two years ago the 6-inch line was replaced with 8-inch pipe, and now the third section is to be enlarged. The old pipe is badly worn, and the increased service demands a larger pipe. The street main now running to New Boston street will be advanced to Page place."

SOME of the gains in sendout recently received from the East show phenomenal advances. The greatest gain is reported from Hartford, Conn., where the increase for the month of July, 1895, compared with the output for July, 1894, figures out a trifle over 35 per cent.

MR. JOHN JACKS has been appointed bookkeeper to the Oswego (N.Y.) Gas Company.

A CORRESPONDENT at Louisville, Ky., forwards the following: "At a meeting of the Directors of the New Memphis (Tenn.) Gas Company, following the recent sale of stock in the Company held by Capt. Sam. S. Brown, of Pittsburgh, Mr. John W. Bailey was elected President, succeeding Mr. N. M. Jones, who withdraws from the Company. Messrs. John M. Peters and C. F. M. Niles also withdrew from the Board. The three vacancies were filled by the election of Messrs. R. A. Parker, Cashier of the Memphis City Bank, Jas. Nathan, Cashier of the Manhattan Savings Bank, and Capt. Thomas Barrett, of New York. The other members of the Board were Messrs. John W. Bailey, T. K. Riddick, Napoleon Hill and J. T. Frost. President Bailey said there would not for the present be any further attempt to consolidate the gas interests of the city.

THE report that the works of the Phœnix Gas Light and Fuel Company, of Phœnixville, Pa., have been leased to Messrs. Janeway & Logan seems to have been premature.

THE South Orange (N. J.) Township Committee has awarded a contract for the partial public lighting of that place to the New Jersey Globe Gas Light Company, on the basis of an annual payment of $17.50 for each gasoline lamp maintained. It is also stipulated that the number of lamps shall not be less than 162.

AT the annual meeting of the Northampton (Mass.) Gas Company the officers elected were: Directors, M. M. French, J. R. Trumbull, L. C. Seelye and John F. Starr; President, M. M. French; Secretary and Treasurer, Geo. P. Dickinson.

THE provisions of the ordinance under which gas is to be sold for the next 10 years in Bay City, Mich., by the Bay City Gas Company, declare that the following rates shall rule: A monthly consumption of 5,000 cubic feet and under, $1.70 per 1,000; 5,000 to 20,000 cubic feet, $1.50 per 1,000; over 20,000 cubic feet, $1.30; gas for fuel purposes, $1.20 per 1,000.

A PINTSCH plant is to be established at Texarkana, Ark., for the purpose of supplying the passenger coaches of the Iron Mountain and the Texas and Pacific Railroads with compressed oil gas for illuminating purposes. Mr. Peter Bauer is to construct the plant.

AT the annual meeting of the Fitchburg (Mass.) Gas and Electric Company the following result was reported: Directors, Rodney Wallace, C. T. Crocker, Francis B. Shepley, Herbert I. Wallace, C. E. Ware, H. T. Page and G. E. Clifford; President, Rodney Wallace; Clerk and Treasurer, H. F. Coggshall.

GAS INSPECTOR MEEDS, of Minneapolis, Minn., reports that the illuminating value of the gas supplied by the Minneapolis Company during the month of July averaged 24.13 candles.

MR. WILLIAM K. PARK, Chief Engineer of the Philadelphia municipal gas works, when interviewed the other day by a newspaper reporter, had this to say about the complaints made by consumers who objected to their bills on the score that the gas charged up to them could not by any possibility have been used by them:

"One day a well-known gentleman came to us with a large bill that had been sent him for the use of gas in his private residence, and he was indignant, saying that he and his family had been in Europe during the three months for which the bill was claimed. Our detective investigated the matter, and he not only found that the family had left one light turned on in the bathroom night and day throughout the three months while they were absent, but the hired help, left behind, had entertained company with brilliant illuminations, as the neighbors testified. Another instance was that of a gentleman who resides on Walnut street, west of Tenth. His bill for one week was $60. The inspector visited the house and found the hand on the meter revolving at a great pace. The cause was found to be with a fixture in a newly-erected storeroom. The gasfitter had neglected to bring a proper cap, and he filled up a ¾-inch opening with cement, which was soon eaten out by the gas, with the result mentioned. The gasfitter settled the bill. Another complaint was made by the proprietors of a store at Ninth and Market streets, that no gas had been burned on their premises for three months, and yet we found 12 to 15 lights that had been going night and day in the cellar of the building without their knowledge. Then there was the case of another Walnut street householder who complained, and we called his attention to the domestic's burning two lights at 9:30 o'clock in the morning, having neglected to turn them off. But one of the funniest instances was that of a gentleman whose home is on Fifteenth street, above Diamond. He and his family went on a vacation to the country, and as he left the house he touched the wrong electric button at the door—the one that turned on six burners. The neighbors finally noticed the house brilliantly lighted at night, and the family apparently absent, and the attention of Chief Meter Inspector Jacob Lang, who resides near by, was called to the illumination. Gaining entrance to the house, he found the heat intense, owing to the extra pressure during the daytime when little service is demanded, about 20 feet an hour being consumed in this house instead of 5 feet."

THE AMERICAN GAS LIGHT JOURNAL

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PROPRIETORS.

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ASST. EDITOR—T. J. Cunningham.
MANAGER—C. E. Sanderson.

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MONDAY, AUGUST 12, 1895.

The Market for Gas Securities.

Consolidated sold up to 145¼ during the week and then fell off to 144, at which price it is offered to-day (Friday), the bid rate at the opening being 142½. No transfers were recorded yesterday, and dullness and strength were the features. We have no reason to recant our opinion of a week ago, and in an ordinarily strong and brisk market the shares would speedily make much higher prices than those ruling. Mutual is very strong, 170½ being on offer for it, and Equitable is somewhat higher. New York and East River common again showed signs of activity, with a trifling advance in the bid rate, the quotations being 30½ to 31¼. The preferred, however, shows signs of weakness, and the mortgage is in the same boat as the preferred. Standard common was active, at advancing figures, on the reports of increased business, but no change is shown in the preferred.

The Brooklyn situation is absolutely featureless, although the majority interest in the Equity Company is inclined to make trouble. The efforts of that interest, however, seem to be misdirected. Quotations in Brooklyn shares at best are only nominal. Chicago gas was a prominent feature in the speculation on the Exchange during the week, the tendency being towards higher prices. The opening to-day was at 59½. This stock ought to be a purchase at the market. Consumers, of Jersey City, is 90½ bid, and we repeat that it is cheap at anything under 95. The bonds are firm, at par bid.

Bay State common is inquired for at 19½, and the incomes are 23 bid.

Western, of Milwaukee, keeps steady, as does Baltimore Consolidated.

Lacledes are improving, and the Detroit folks keep the peg in firmly at 29 to 31.

Indianapolis gas is again on the rise, and some enthusiasts are predicting its advance to 175 before the end of the year.

The reports respecting increased sales of gas, particularly in the East, are marked.

Gas Stocks.

Quotations by Close & Nash, Brokers and Dealers in Gas Stocks.

35 WALL ST., NEW YORK CITY.

AUGUST 12.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$35,480,000	100	142½	144
Central	500,000	50	140	..
" Scrip	220,000	..	100	..
Equitable	4,000,000	100	194¾	..
Bonds, 6's	1,000,000	1,000	106	..
" 1st Con. 5's	2,300,000	1,000	113	115
Metropolitan Bonds	658,000	..	108	112
Mutual	3,500,000	100	170½	..
" Bonds	1,500,000	1,000	100	102
Municipal Bonds	750,000	..	..	.
Northern	150,000	50	90	91
" Bonds	150,000	1,000	..	98
New York and East River	5,000,000	100	30¼	31¼
Preferred	2,000,000	100	54	56
Bonds	3,500,000	1,000	90½	92
Richmond Co., S. I.	348,650	50	50	..
" Bonds	100,000	1,000	..	..
Standard	5,000,000	100	65	68
Preferred	5,000,000	100	107	..
Bonds, 1st Mortgage, 5's	1,500,000	1,000	107	..
Yonkers	200,650	50	112	.
Gas Co's of Brooklyn.				
Brooklyn	2,000,000	25	125	..
Citizens	1,200,000	20	65	..
" S. F. Bonds	330,000	1,000	..	101
Equity	2,000,000	10	..	..
" Bonds	1,000,000	..	..	..
Fulton-Municipal	3,000,000	100	175	..
" Bonds	300,000	..	108	..
Peoples	1,000,000	10	90	.
" Bonds, 7's	308,000	..	100	..
" " 6's	94,000	..	98	100
Metropolitan	870,000	100	170	..
" Bonds, 5's	70,000	..	..	..
Nassau	1,000,000	25	225	..
" Ctfs.	700,000	1,000	99	100
Williamsburgh	1,000,000	50	210	..
" Bonds	1,000,000	..	107	110
Out-of-Town Companies.				
Bay State	5,000,000	50	19½	20
" Income Bonds	2,000,000	1,000	23	..
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	..	80
2d " " "	3,000,000	1,000	..	82
Buffalo Mutual	750,000	100	125	..
" Bonds	200,000	1,000	95	100
Chicago Gas Co.	25,000,000	100	58¾	59
Chicago Gas Lt. & Coke Co.				
Guaranteed Gold Bonds	7,850,000	1,000	93	93½
Columbus	1,000,000	..	63	66
1st Mortgage	1,085,000	..	91	93
Consumers, Jersey City	2,000,000	100	90½	..
" Bonds	600,000	1,000	100	..
Cincinnati G. & C. Co.	7,000,000	100	203	203¾
Consumers, Toronto	1,800,000	50	184½	187
Central, San Francisco	.....	..	90	100
Capital, Sacramento	.....	.	..	50
Consolidated, Baltimore	11,000,000	100	68¾	69
Mortgage, 6's	3,800,000	..	107	107½
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910,000	..	..	..
Consolidated, 1st 5's	1,400,000	..	..	..
Detroit	4,000,000	..	29	31
" Con. Bonds	4,812,000	..	75	..
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Fort Wayne	2,000,000	..	72½	74½
" Bonds	2,000,000	..	85	..
Hartford	750,000	25	120	128
Indianapolis	2,000,000	..	150	155
" Bonds, 6's	2,650,000	..	105½	..
Jersey City	750,000	20	180	..
Lafayette Gas Co., Ind.	1,000,000	100	85	86
Bonds	1,000,000	1,000	88	90
Louisville	2,570,000	50	..	130
Laclede, St. Louis	7,500,000	100	26½	27
Preferred	2,500,000	100	86	87
Bonds	9,084,400	1,000	98	
Little Falls, N. Y.	50,000	100	..	100
Bonds	25,000	..	..	100
Montreal, Canada	2,000,000	100	200	..
New Haven	.....	25	225	..
Northwestern Ohio Nat. Gas	.....	..	48	..
Oakland, Cal.	.....	..	42½	43
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	2,100,000	1,000	..	108
2d "	2,500,000	1,000	104	105
Peoples, Jersey City	500,000	50	..	175
Paterson, N. J.	.....	25	99	102
Rochester Gas & Elec. Co.	2,150,000	50	..	..
Preferred	2,150,000	50	88	..
Consolidated 5's	2,000,000	..	87½	90
San Francisco, Cal.	10,000,000	100	72¾	73¼
St. Paul Gas Light Co.	1,500,000	100	68	70
1st Mortgage, 6's	650,000	..	..	..
Extension, 6's	600,000	..	..	..
General Mortgage, 5's	2,400,000	..	88	90
Syracuse, N. Y.	500,000	25	..	..
Washington, D. C.	2,000,000	20	250	..
Western, Milwaukee	4,000,000	100	66	68
Bonds, 5's	3,556,000	..	95½	96½
Wilmington, Del.	500,000	50	188	190

Advertisers' Index.

GAS ENGINEERS.

	Page
Jos. R. Thomas, New York City	280
Wm. Henry White, New York City	279
Fred. Bredel, Milwaukee, Wis.	275
H. C. Slaney, Brooklyn, N. Y.	279
Geo. R. Rowland, New York City	279
The Western Gas Construction Co., Fort Wayne, Ind.	270
Humphreys & Glasgow, New York City	266
T. G. Lansden, St. Louis, Mo.	279

PROCESSES.

Bartlett, Hayward & Co., Baltimore, Md.	277
United Gas Improvement Co., Phila., Pa.	269
Burdett Loomis, Hartford, Conn.	278
National Gas and Water Co., Chicago, Ills.	271
Economical Gas Apparatus Construct'n Co., Toronto, Ont	283
The Western Gas Construction Co., Fort Wayne, Ind.	270

GAS WORKS APPARATUS AND CONSTRUCTION.

James R. Floyd & Sons, New York City	280
Continental Iron Works, Brooklyn, N. Y.	278
Deily & Fowler, Phila., Pa.	280
Kerr Murray Mfg. Co., Fort Wayne, Ind.	273
Stacey Mfg. Co., Cincinnati, Ohio	279
Bartlett, Hayward & Co., Baltimore, Md.	277
Davis and Farnum Mfg. Co., Waltham, Mass.	276
R. D. Wood & Co., Phila., Pa.	278
Isbell-Porter Company, New York City	278
Fred. Bredel, Milwaukee, Wis.	275
United Gas Improvement Co., Phila., Pa.	269
Berlin Iron Bridge Co., East Berlin, Conn.	266
National Gas and Water Co., Chicago, Ills.	271
Economical Gas Apparatus Construct'n Co., Toronto, Ont.	283
The Western Gas Construction Co., Fort Wayne, Ind.	270
Humphreys & Glasgow, New York City	266
Gas Engineering Co., Pittsburgh, Pa.	263

SCRUBBERS AND CONDENSERS.

G. Shepard Page's Sons, New York City	279
R. D. Wood & Co., Phila., Pa.	278
James R. Floyd & Sons, New York City	280
Continental Iron Works, Brooklyn, N. Y.	278
Gas Engineering Co., Pittsburgh, Pa.	263

REGENERATIVE FURNACES.

Bartlett, Hayward & Co., Baltimore, Md.	277
Fred. Bredel, Milwaukee, Wis.	275
J. H. Gautier & Co., Jersey City, N. J.	275
Parker-Russell Mining and Mfg. Co., St. Louis, Mo.	274
Adam Weber, New York City	274

TAR AND CARBONIC ACID EXTRACTOR.

G. Shepard Page's Sons, New York City	279

AMMONIA CONCENTRATORS.

Michigan Ammonia Works, Detroit, Mich.	260
G. Shepard Page's Sons, New York City	279
Gas Engineering Co., Pittsburgh, Pa.	263

GAS METERS.

John J. Griffin & Co., Phila., Pa.	284
American Meter Co., New York and Philadelphia	283
The Goodwin Meter Co., Phila., Pa.	282
Helme & McIlhenny, Phila., Pa.	283
D. McDonald & Co., Albany, N.Y.	283
Nathaniel Tufts, Boston, Mass.	282
Maryland Meter and Mfg. Co. Baltimore, Md.	282
Metric Metal Co., Erie, Pa	281

GAS AND WATER PIPES.

Ohio Pipe Co., Columbus, Ohio	281
M. J. Drummond, New York City	281
R. D. Wood & Co., Phila., Pa.	278
Warren Foundry and Machine Co., New York City	281
Donaldson Iron Co., Emaus, Pa.	281
Addyston Pipe and Steel Co., Cincinnati, O.	280
John Fox, New York City	281

GAS BAGS.

Peerless Rubber Mfg. Co., New York City	259

STEAM BLOWER FOR BURNING BREEZE.

H. E. Parson, New York City..... 275

GAS COALS.

Penn Gas Coal Co., Phila., Pa..... 273
Perkins & Co., New York City..... 272
Despard Gas Coal Co., Baltimore, Md..... 273
Westmoreland Coal Co., Phila., Pa..... 273
Shaner Coal Co., Philadelphia, Pa..... 260
Berwind-White Coal Mining Co., New York and Phila... 272
Henry C. Scheel, New York City..... 273

CANNEL COALS.

Perkins & Co., New York City..... 272
Log Mountain Coal, Coke and Timber Co., Pineville, Ky. 273
The Goff-Kirby Coal Co., Cleveland, O..... 272
Henry C. Scheel, New York City..... 273
Thos. N. Mordue, New York City..... 260

GAS ENRICHERS.

Standard Oil Co., New York City..... 273
The Sun Oil Co., Pittsburgh, Pa..... 273
W. H. Townsend, New York City..... 273

COKE CRUSHER.

C. M. Keller, Columbus, Ind..... 273

CONVEYING MACHINERY.

C. W. Hunt Company, N. Y. City..... 264

GAS GAUGES.

The Bristol Co., Waterbury, Conn..... 259

GAS GOVERNORS.

Connelly Iron Sponge and Governor Co., New York City. 271
Wilbraham Baker Blower Co., Phila., Pa..... 271
Isbell-Porter Co., New York City..... 278

SELF-SEALING MOUTHPIECE DOORS.

Isbell-Porter Company, New York City..... 278
Continental Iron Works, Brooklyn, N. Y..... 278
G. Shepard Page's Sons, New York City..... 279

RETORTS AND FIREBRICK.

J. H. Gautier & Co., Jersey City, N. J..... 274
B. Kreischer & Sons, New York City..... 274
Adam Weber, New York City..... 274
Laclede Firebrick Mfg. Co., St. Louis, Mo..... 274
Cyrus Borgner, Phila., Pa..... 274
James Gardner, Jr., Pittsburgh, Pa..... 274
Henry Maurer & Son, New York City..... 274
Baltimore Retort and Firebrick Co., Baltimore, Md..... 274
Parker-Russell Mining and Mfg. Co., St. Louis, Mo..... 274
Brooklyn Firebrick Works, Brooklyn, N. Y..... 274
F. Behrend, New York City..... 264

CEMENTS.

C. L. Gerould & Co., Mount Vernon, N. Y..... 274
F. Behrend, New York City..... 264

INCANDESCENT GAS LAMPS.

Welsbach Light Co., Gloucester, N. J..... 263

MICA GOODS.

The Mica Mfg. Co., New York City..... 260

BURNERS.

C. A. Gefrorer, Phila., Pa..... 278
Moses G. Wilder, Phila., Pa..... 260

LAVA GAS TIPS.

D. M. Steward Mfg. Co., Chattanooga, Tenn..... 259

GAS TUBING.

New York Gas Tubing Co., New York City..... 260

STREET LAMPS.

J. G. Miner, Morrisania, New York City..... 275
Bartlett Lamp Mfg. Co., New York City..... 275

PURIFYING MATERIALS.

Connelly Iron Sponge and Governor Co., New York City 271
Greenpoint Chemical Works, Brooklyn, N. Y..... 271
Henry W. Douglas, Ann Arbor, Mich..... 271
Read, Holliday & Sons, Ltd., New York City..... 264

EXHAUSTERS.

The P. H. & F. M. Roots Co., Connersville, Ind..... 268
Isbell-Porter Company, New York City..... 278
Wilbraham Baker Blower Co., Philadelphia, Pa..... 271
Connelly Iron Sponge and Governor Co., New York City 271

VALVES.

Ludlow Valve Manufacturing Co., Troy, N.Y..... 270
Chapman Valve Manufacturing Co., Boston, Mass..... 270
R. D. Wood & Co., Phila., Pa..... 278
Continental Iron Works, Brooklyn, N. Y..... 278
John Fox, New York City..... 281
The P. H. & F. M. Roots Co., Connersville, Ind..... 268
Isbell-Porter Co., New York City..... 278
The Western Gas Construction Co., Fort Wayne, Ind.... 270

ELECTRICAL APPARATUS.

Wm. Henry White, New York City..... 279

GAS ENGINES.

Otto Gas Engine Works, Phila., Pa..... 240
The American Gas Engine Co., Phila., Pa..... 261

ENGINES AND BOILERS.

The Hazelton Boiler Company, New York City..... 260
W. G. & G. Greenfield, East Newark, N. J..... 260

PURIFIER SCREENS.

John Cabot, New York City..... 260

GAS STOVES.

American Meter Co., New York and Philadelphia..... 267
The Goodwin Meter Co., Phila., Pa..... 282
George M. Clark & Co., Chicago, Ills..... 265
Maryland Meter and Manufacturing Co., Baltimore, Md.. 282
The Schneider & Trenkamp Co., Cleveland, O..... 264
William M. Crane & Co., New York City..... 265
Keystone Meter Co., Royersford, Pa..... 263

CHINA GAS KILNS.

F. A. Wilke, Richmond, Ind..... 260
William M. Crane & Co., New York City..... 265

GAS FLOW COMPUTERS.

Wm. Cox, Stapleton, N. Y..... 277

COIN WRAPPERS.

Alvord & Co., Detroit, Mich..... 216

GASHOLDER PAINT.

The Government Waterproof Paint Co., Boston, Mass.... 270
New York Marine Paint Co., Poughkeepsie, N.Y..... 270

GASHOLDER TANKS.

J. P. Whittier, Brooklyn, N. Y..... 275

GASHOLDERS.

Bartlett, Hayward & Co., Baltimore, Md..... 277
Continental Iron Works, Brooklyn, N. Y..... 278
Deily & Fowler, Philadelphia, Pa..... 260
Davis & Farnum Mfg. Co., Waltham, Mass..... 276
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 276
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By a man who has had a round experience in the manufacture and sale of gas,

A Position as Supt. of a Large or Small Gas Works.

Is capable and energetic, and is willing to begin at a moderate salary. Address

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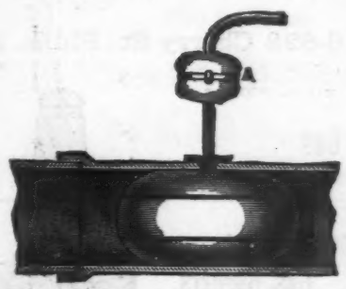

These Gas Bags are used to stop the flow of gas while repairing or making alterations in gas mains. There have been numerous cases of workmen being badly injured, and sometimes fatally, by the escape of gas resulting from the bursting of a bag, and our patent improvement is designed to obviate such calamities. The indicator *A* shows unerringly when the bag has been sufficiently inflated to pack the main, and when the pumping should be stopped. Our Bags are made of a rubber stock especially prepared to admit of great distension, and to resist the action of Oils, Gases, Naphtha and other residuum in the mains, and they are made with lapped joints, which adds greatly to their strength.

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5 " " "	1.05		20 " " "		12.00
6 " " "	1.75		24 " " "		17.00
8 " " "	2.65		30 " " "		27.50
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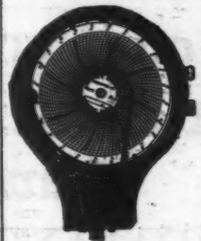

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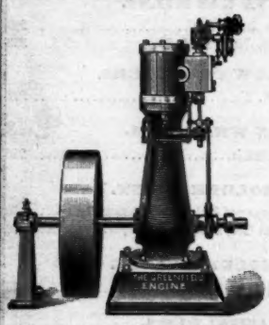

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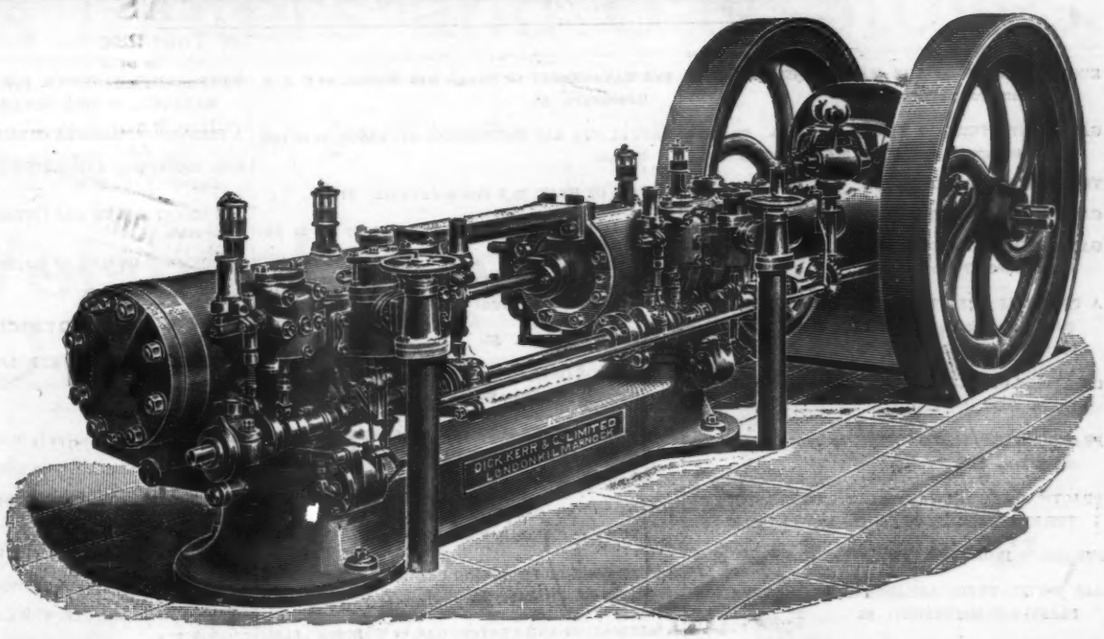

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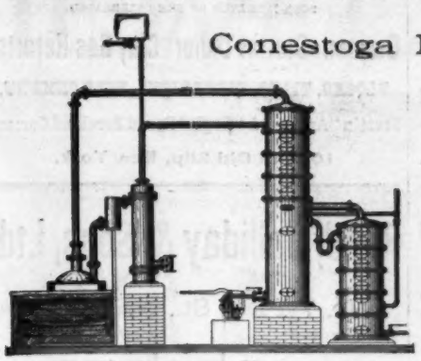

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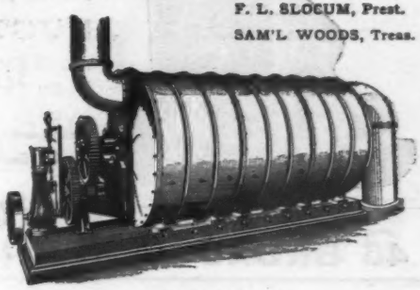

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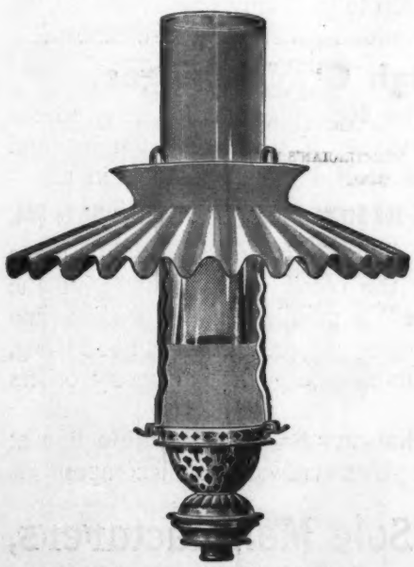

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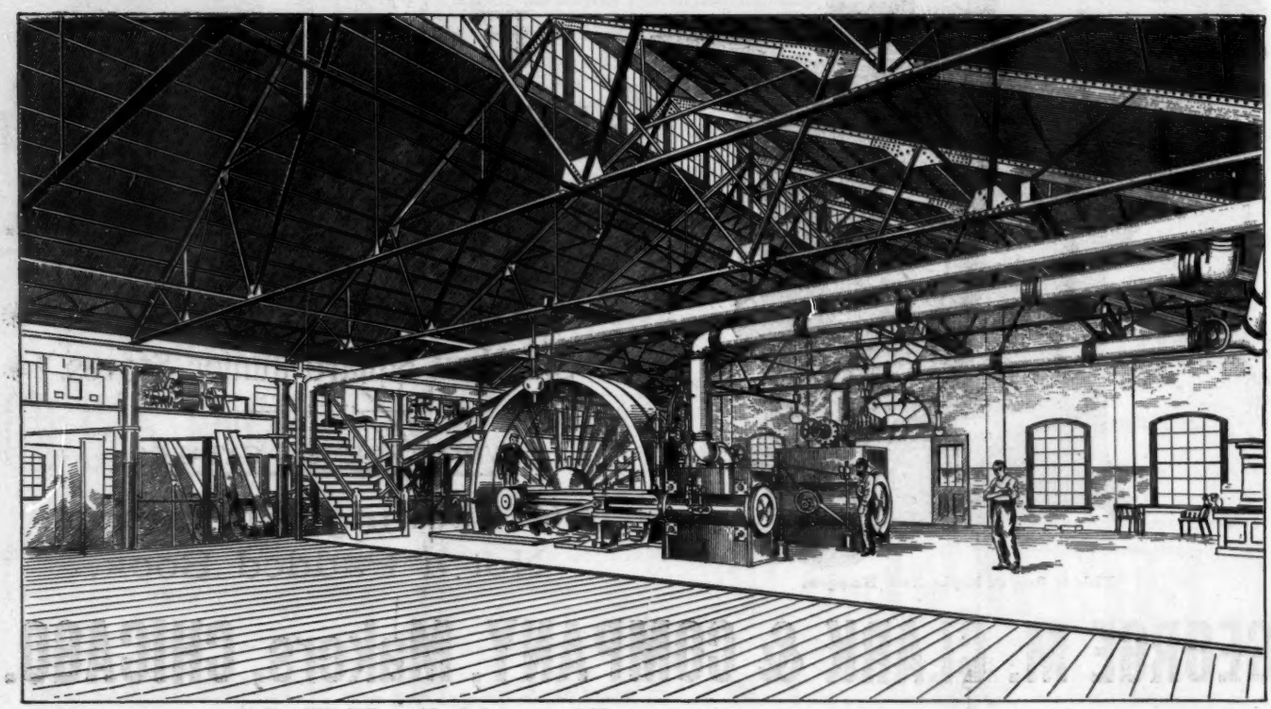

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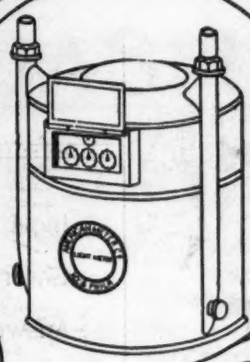

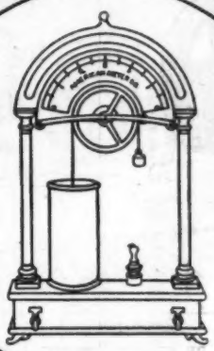

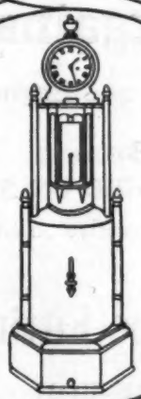

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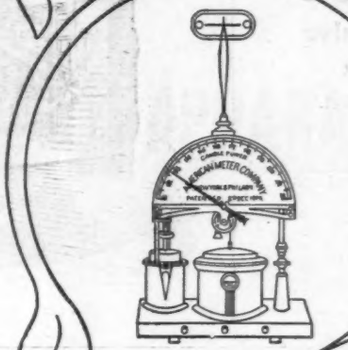
PUBLIC LIGHTING TABLE.

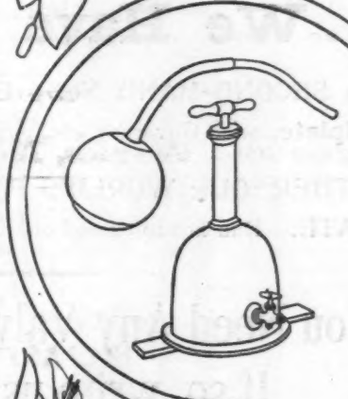
AUGUST, 1895.

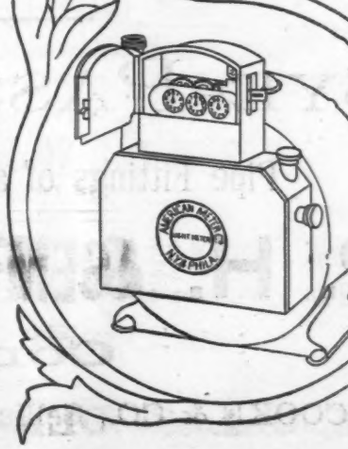
Day of Week.	Table No. 1. Following the Moon. Date.	Light.	Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Extinguish.
				P.M.	A.M.
Thu.	1	12.40 AM	4.00 AM	7.10	3.30
Fri.	2	1.40	4.00	7.10	3.30
Sat.	3	2.40	4.00	7.10	3.30
Sun.	4	No L.	No L.	7.10	3.30
Mon.	5	No L. FM	No L.	7.10	3.30
Tue.	6	No L.	No L.	7.10	3.45
Wed.	7	7.40 PM	9.10 PM	7.10	3.45
Thu.	8	7.40	9.30	7.10	3.45
Fri.	9	7.40	9.50	7.10	3.45
Sat.	10	7.40	10.10	7.10	3.45
Sun.	11	7.30	10.30	7.10	3.45
Mon.	12	7.30	11.00	7.10	3.45
Tue.	13	7.30 LQ	11.30	6.55	4.00
Wed.	14	7.30	12.10 AM	6.55	4.00
Thu.	15	7.30	1.00	6.55	4.00
Fri.	16	7.30	2.10	6.55	4.00
Sat.	17	7.30	4.20	6.55	4.00
Sun.	18	7.20	4.20	6.55	4.00
Mon.	19	7.20	4.20	6.55	4.00
Tue.	20	7.20 NM	4.20	6.45	4.10
Wed.	21	7.20	4.20	6.45	4.10
Thu.	22	7.20	4.20	6.45	4.10
Fri.	23	7.20	4.20	6.45	4.10
Sat.	24	7.20	4.20	6.45	4.10
Sun.	25	8.20	4.20	6.45	4.10
Mon.	26	9.00 FQ	4.20	6.45	4.10
Tue.	27	9.50	4.20	6.30	4.20
Wed.	28	10.40	4.20	6.30	4.20
Thu.	29	11.30	4.20	6.30	4.20
Fri.	30	12.40 AM	4.20	6.30	4.20
Sat.	31	1.40	4.20	6.30	4.20

TOTAL HOURS LIGHTING DURING 1895.

By Table No. 1.	Hrs.Min.	By Table No. 2.	Hrs.Min.
January	237.00	January	423.20
February	196.40	February	355.25
March	195.50	March	355.35
April	165.30	April	298.50
May	153.40	May	264.50
June	138.20	June	234.25
July	146.30	July	243.45
August	152.50	August	280.25
September	165.10	September	321.15
October	186.10	October	374.30
November	204.10	November	401.40
December	219.30	December	433.45
Total, yr.	2161.20	Total, yr.	3987.45







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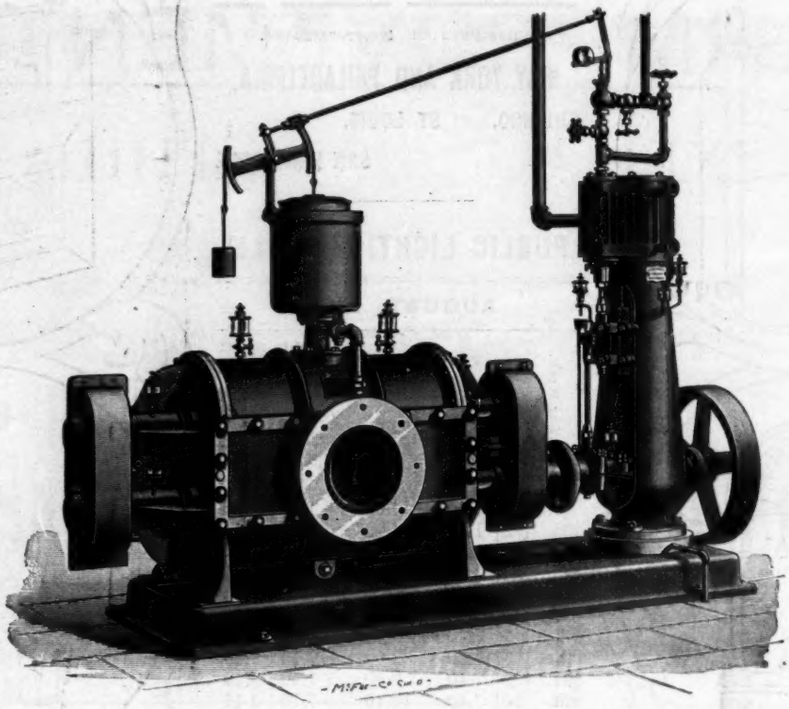

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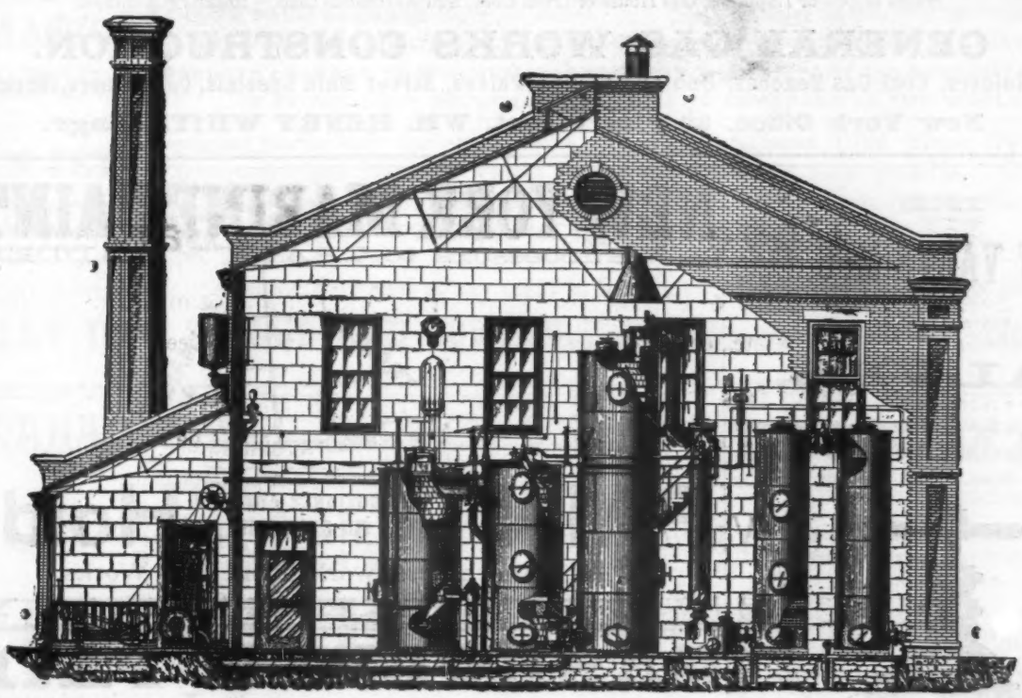

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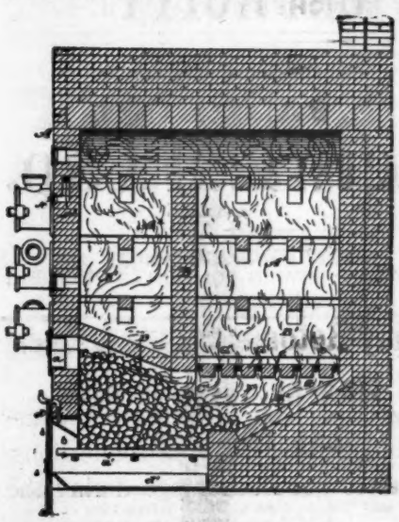

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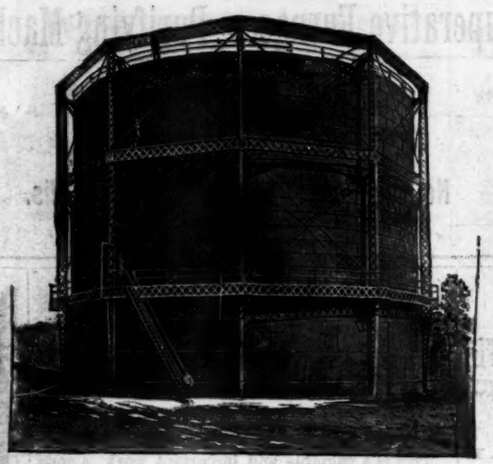

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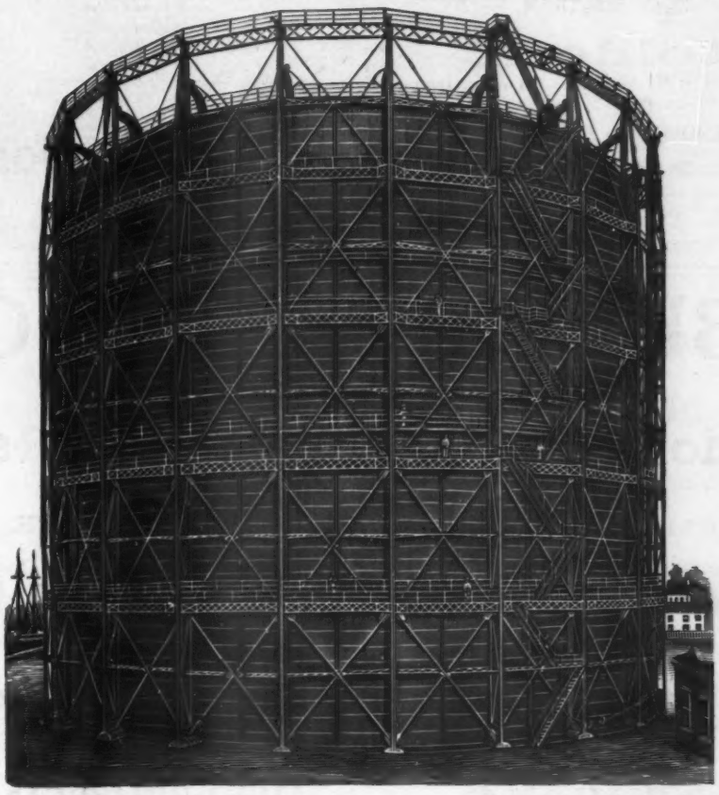

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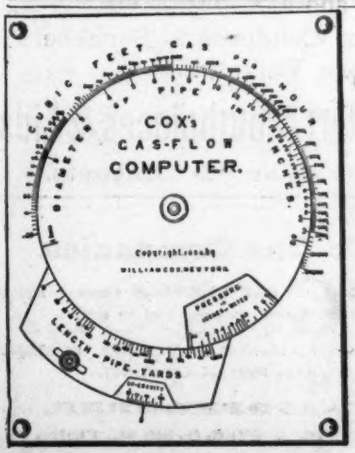

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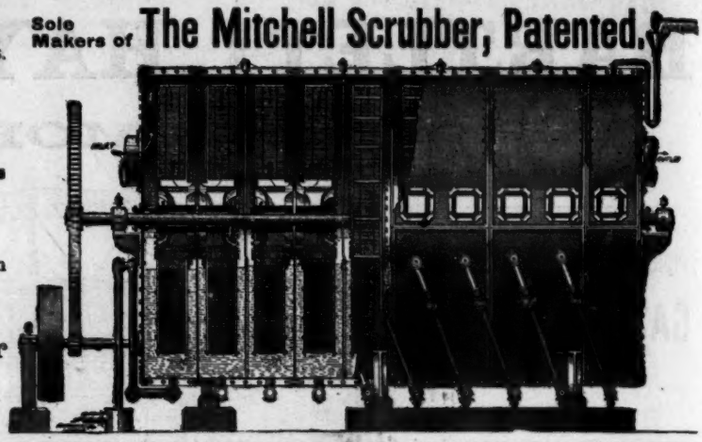

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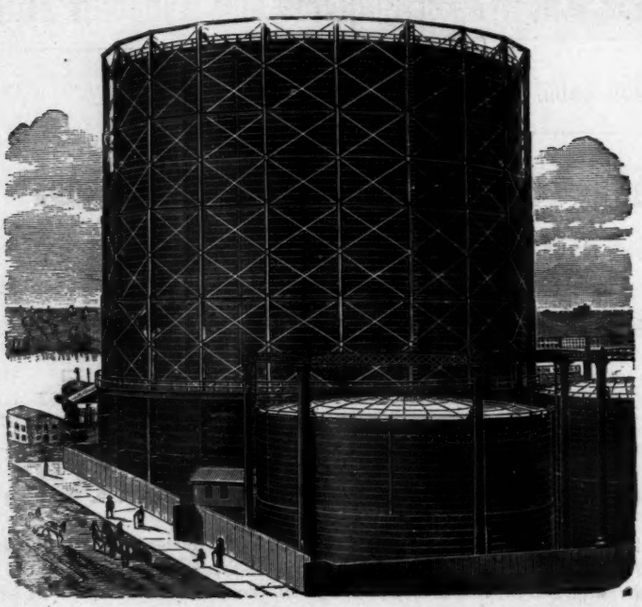

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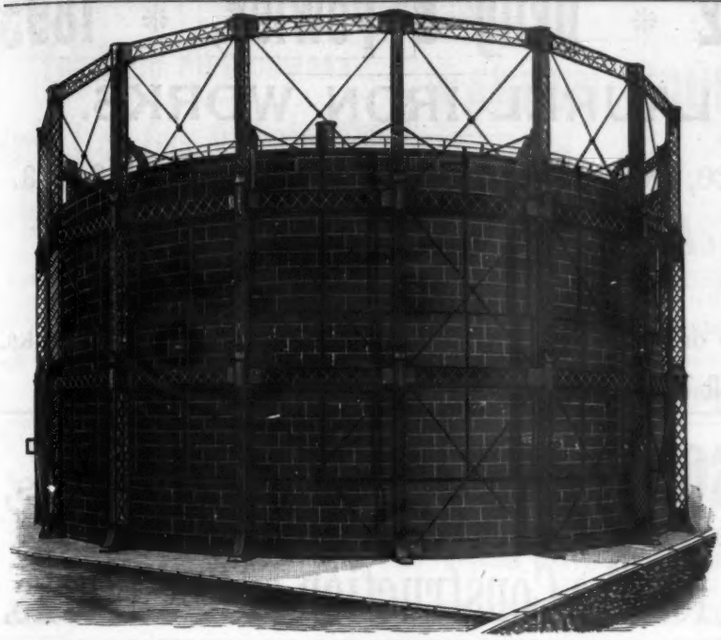

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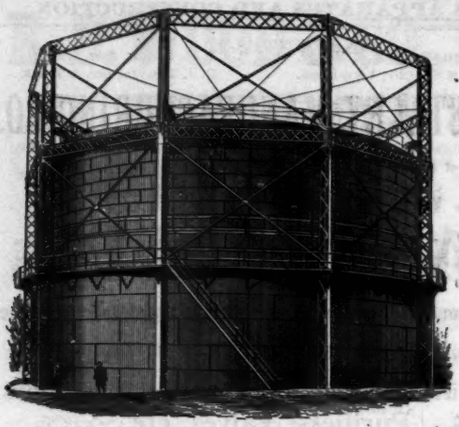

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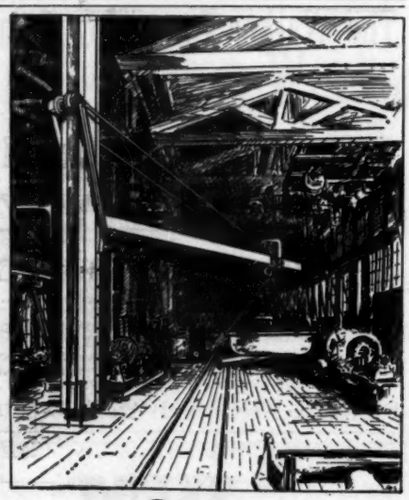

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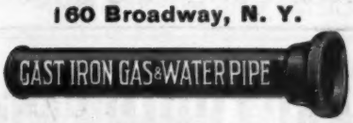

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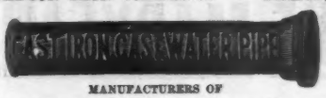

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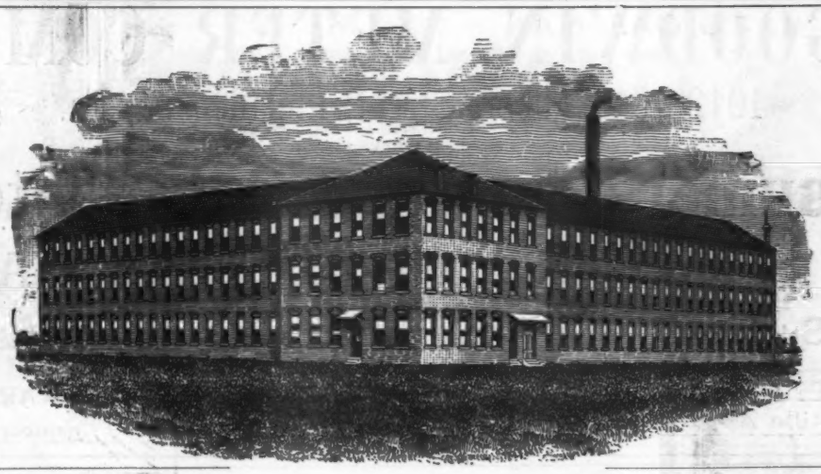

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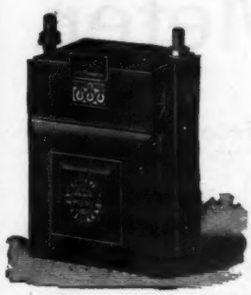

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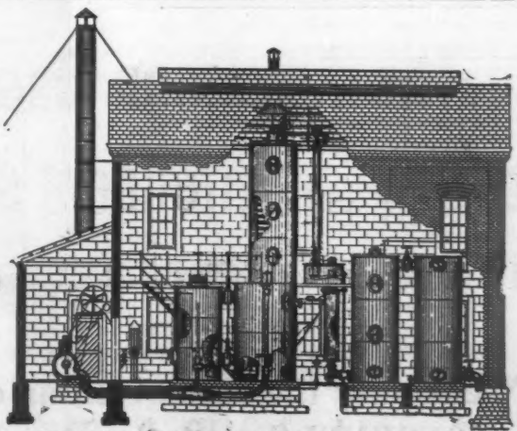

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